

Introduction/Background

Quality issues in the oncologic emergency care setting are well known. Common emergency department (ED) concerns include overcrowding, long wait times (perceived and actual), boarding, ambulance diversions, inadequate access to specialists, and patient handoffs. Additionally, some issues (e.g., patients with multiple visits near the end of life and those diagnosed in that ED with late-stage cancer) are well recognized in the ED but are not directly related to care delivered in the ED. Instead, they are reflective of broader cancer quality issues, such as inadequate access to and utilization of cancer prevention and diagnostic services, insufficient care coordination, fragmented healthcare delivery, poor symptom management, and underutilized hospice and palliative care services.

To address these and other healthcare quality issues, experts have developed quality measures assessing the underlying structures and processes, as well as outcomes, of care. These quality measures are used by state and federal agencies for purposes of accountability and public reporting. Increasingly, they are being used by payers for value-based payment programs. Despite the face validity and inherent appeal of public reporting and transparency of healthcare quality, there is minimal evidence linking public reporting of healthcare quality measures with meaningful improvements in the safety, appropriateness, effectiveness, and overall quality of US healthcare delivery [1, 2]. In view of these observations, it is important to consider the health policy and practice patterns that have contributed to these issues, as well as a path forward.

This chapter examines the history, current state, and desired future state of health policy for quality in oncologic emergency care. It describes observed quality issues, including upstream drivers, and highlights the important role of quality measures in addressing these issues. Additionally, it outlines recommendations for measuring quality in oncologic emergency care and proposes healthcare policy changes and quality measures that could help effect these changes. Finally, it highlights activities at The University of Texas MD Anderson Cancer Center (MD Anderson) to improve the quality of oncologic emergency care.

History and Current State of Health Policy for Quality in Oncologic Emergency Care

Much of the formal health policy that has shaped oncologic emergency care is not specific to cancer. Instead, it focuses on providers' duty to treat patients in an emergency as well as patient access to emergency medical care. This section

describes two key drivers of current health policy for emergency medicine—the no-duty-to-treat principle and the Emergency Medical Treatment and Active Labor Act (EMTALA). The sections that follow explore known issues in oncologic emergency care, factors that have contributed to the current state, and historical efforts to measure the quality of US emergency care.

The No-Duty-to-Treat Principle and the Emergency Medical Treatment and Active Labor Act (EMTALA)

The no-duty-to-treat principle, which affords physicians significant autonomy in determining which patients they will serve, has been the controlling law in the USA for over a century [3]. Several state court cases have supported this principle and have generally held that duty-to-treat begins when the patient-provider relationship is established, regardless of whether the relationship is expressly agreed [4–9]. While the no-duty-to-treat principle remains the controlling law, federal and state entities have established safeguards—through statutes, regulations, and court cases—to prevent discrimination and to ensure access to emergency care [3, 10–17].

Enacted through the Consolidated Omnibus Budget Reconciliation Act of 1986 [18], EMTALA is the most influential US law affecting emergency care. The law obligates EDs to provide care to all people with an emergency medical condition, even those who are not established patients [3]. Specifically, EDs must screen, stabilize, and, where necessary, accept transfer patients, regardless of their insurance status or ability to pay. Moreover, it gives EDs the right to transfer unstable patients based on medical necessity, if the potential medical benefit outweighs the risks (e.g., transferring the patient to a facility for emergency care that is unavailable at the current facility). As an “antidumping” law, it prohibits hospitals from refusing to treat uninsured or underinsured patients, from transferring unstable patients (except where deemed medically necessary, as described above), and from refusing to accept transfer patients that require specialized emergency care that is unavailable elsewhere. EMTALA applies to all EDs at hospitals that care for Medicare beneficiaries, and EMTALA violations can lead to suspension from the Medicare program.

Over time, EMTALA's provisions have been clarified through various statutes, regulations, and court cases [3, 19–25], including the Patient Protection and Affordable Care Act of 2010 (ACA) [26, 27]. Nonetheless, many EMTALA provisions, as clarified, remain controversial. For example, EMTALA is intended to ensure equitable access to and provision of emergency care, but not to regulate the quality of care. Thus, misdiagnosis and medical negligence remain the

purview of state medical malpractice law and do not constitute EMTALA violations as long as the emergency care was delivered in good faith. Additionally, EMTALA's stabilization obligations have been held as absolute, even when care is futile due to an underlying condition or when it conflicts with a physician's moral and ethical judgment and professional standards of care. Other revisions have focused on the physical locations that fall within the jurisdiction of EMTALA, such that EMTALA applies to emergency medical conditions presenting in urgent care and outpatient care facilities (*under certain conditions*) and to hospital parking lots, driveways, and sidewalks. Importantly, outpatients with scheduled nonemergency procedures are excluded, and hospitals' stabilization duties and transfer rights and duties under EMTALA are terminated once the patient is admitted as an inpatient [3, 20, 28–30].

In summary, the no-duty-to-treat principle and EMTALA—as written and subsequently clarified—create a strong policy framework to ensure patient access to emergency medical care in the USA. EMTALA has effectively transformed EDs into a safety net for those who lack access to or cannot afford primary care. A predictable, albeit unintended, consequence is that the US emergency care system is overloaded and inadequately funded to comply with this federal mandate [31]. This compromises the quality and accessibility of emergency care for all patients, including those with a cancer diagnosis. Recognized quality issues for oncologic emergency care are described in the next section of this chapter.

Known Quality Issues

As noted previously, ED cancer patients experience many of the same issues that non-cancer patients experience, while other issues are specific to oncology patients. Moreover, some issues manifest in ED care but are more directly associated with quality issues in the primary care setting or derive from inadequate access to care. Six issues that affect cancer patients in the emergency setting are described below: (1) late-stage cancers presenting to the ED, (2) overutilization of ED services, (3) overcrowding, boarding, and diversion, (4) high costs at the end of life, (5) patient dissatisfaction with emergency care, and (6) caregiver burden. Specific issues for dedicated oncology EDs are also discussed in this section.

Late-Stage Cancers Presenting to the ED

In a well-coordinated healthcare system where patients receive routine primary care and guideline-based cancer screenings, cancer diagnoses should be made in the primary care setting. However, many undiagnosed cancers present to the ED each year [32–35], with approximately 204,000 cancers diagnosed in US EDs in 2006 [36]. This is problematic for a number of reasons. First, these patients often have non-

specific symptoms (e.g., nausea and vomiting, fatigue, and bleeding) that may be attributed to a number of different conditions. Moreover, ED physicians do not have established relationships with these patients and may lack a comprehensive medical background for them. Therefore, cancer may be misdiagnosed and treatment further delayed until the patient seeks follow-up care in the outpatient setting. Second, when patients are diagnosed in the ED, the cancers tend to be of later stage and, therefore, of poorer prognosis. Worsened outcomes, including higher perioperative mortality, lower overall survival, higher readmissions, and longer length of stay, have been observed by Mitchell et al. [33], Hargarten et al. [34], and Amri et al. [35]. Third, ED-based cancer diagnoses suggest disparities in healthcare. For example, a Michigan study of ED-based lung and colorectal cancer diagnoses demonstrated that cancer diagnoses in the ED were disproportionate among older people, African Americans, dual-eligible patients (patients eligible for Medicare and Medicaid benefits), and patients with three or more comorbidities. Of note, these patients had significantly more inpatient, outpatient, and primary care encounters in the months preceding their diagnosis than their counterparts diagnosed in a nonemergency setting [32]. This suggests that the quality, rather than the quantity, of the healthcare services received by some of these patients was insufficient to detect their cancer earlier. These findings highlight gaps in the nation's population health strategies and indicate opportunities for improved patient education, better screening adherence, earlier detection, and improved care coordination—particularly for more vulnerable populations.

Overutilization of ED Services

Cancer patients present to the ED with acute conditions, including sepsis, spinal cord compression, deep vein thrombosis, and respiratory and gastrointestinal obstruction. This is an appropriate use of emergency resources, as ED physicians are trained to diagnose and treat acute illness and injury and to stabilize patients for further treatment. However, in a 2002–2003 prospective observational study from Argentina, Diaz-Couselo et al. demonstrated that only 26 % of oncology patients seeking emergency care represented true oncologic emergencies [37]. Additionally, Wallace et al. determined that 52 % of ED presentations in their study were avoidable [38]. Together, these findings suggest significant overutilization of emergency services, where cancer patients seek care in the ED for symptoms associated with progression of disease and treatment side effects that could be effectively managed in the outpatient setting. Cancer patients seeking emergency care often have several interrelated symptoms, including pain, fatigue, dyspnea, nausea, dehydration, depression, and cognitive impairment. Chronic pain, in particular, is a frequent complaint among cancer patients visiting the ED. Evaluating and managing these symptoms

independently is insufficient. With inadequate attention to and coordination of symptom management, cancer patients make frequent visits to the ED, especially near the end of life [39]. Several observational studies have examined the utilization of ED services among cancer patients at the end of life. The findings of these studies vary, with 27–37 % of the studied cohorts having an ED visit in the last 14 days of life and 7–19 % of the studied cohorts having multiple ED visits in the last 30 days of life [40]. Similarly, in a 2010 study of hospice enrollees, Carlson et al. found that patients that disenrolled from hospice were significantly more likely to have an ED visit compared to their continuously enrolled counterparts (33.9 % vs. 3.1 %) [41].

Frequent ED visits have been identified as an indicator of poor quality of care [42]. Aprile et al. concluded that over 50 % of unplanned visits at an acute oncology clinic were repeat presentations [43]. In some cases, repeat ED visits indicate healthcare access issues, with cancer patients receiving care in the emergency setting that could be delivered in a less costly outpatient setting. In other cases, repeat ED visits indicate that patients—in particular, patients with complex comorbidities, impaired performance status, or poor prognosis—are receiving overly aggressive treatment (e.g., chemotherapy), where the treatment toxicities outweigh the potential clinical benefits. Repeat ED visits may also indicate delayed access to hospice and palliative care services or that caregivers are not adequately prepared to manage and cope with the patient's burden of disease at home. Furthermore, repeat ED visits may indicate that patients are receiving inadequate discharge instructions or follow-up care coordination or that the patients' symptoms were inadequately managed during the initial ED visit. These trends highlight the need for more selective use of aggressive treatment, improved symptom management, and earlier introduction of advance care planning. Likewise, greater access to palliative and hospice care, same-day/next-day physician appointments, and 24/7 access to providers may reduce ED utilization by cancer patients, particularly at the end of life. These care delivery approaches are discussed later in this chapter.

Overcrowding, Boarding, and Ambulance Diversion

The demand for emergency services routinely exceeds ED capacity, with most EDs (especially in large urban areas) reporting problems with overcrowding. ED crowding has worsened over time, due to coalescing system-level issues, including ED closures, inadequate or delayed access to primary and specialty care, and higher rates of uninsurance and underinsurance [44]. ED crowding is worsened by ED “boarding,” where admitted patients remain in the ED for hours—even days—until a hospital bed becomes available. ED boarding has become routine for most EDs and is the

product of high inpatient census rates and inefficient admission processes [31]. ED overcrowding and extended ED boarding have been associated with treatment delays, increased risk for medical errors, patients leaving the ED without being seen, compromised quality of care and patient experience with care, and poorer outcomes, including longer lengths of stay and higher inpatient mortality rates [45–48].

Unmanaged ED crowding and prolonged ED boarding contribute to ambulance diversion. Once a practice reserved for catastrophic events, diversion has become increasingly common, particularly in urban areas. Diversion can place patients with acute conditions at significant risk by delaying treatment or by redirecting patients to EDs that lack the resources and expertise to optimally care for their severity of illness [31]. Furthermore, extended diversion time has been associated with adverse patient outcomes, particularly for patients with life-threatening conditions [49–52]. Together, ED overcrowding, extended boarding, and ambulance diversion contribute to a stressful work environment for ED providers and increase patients' risk for adverse events and poorer outcomes. Accordingly, experts have advocated for stronger standards to reduce these practices [31]. While these findings and recommendations are generalized to emergency care and are not specific to oncologic emergency care, they nonetheless have important implications for cancer patients seeking ED care.

High Costs at The End of Life

In 2010, an estimated \$38 billion was spent on end-of-life care for cancer patients in the USA. By 2020, those costs are projected to increase to between \$49 billion and \$74 billion, representing up to 36 % of total spending for cancer care in the USA [53]. This high level of spending at the end of life has been attributed to fragmented healthcare delivery, frequent transitions between care settings, inadequate care coordination, lack of access or delayed access to palliative and hospice care, and overutilization of aggressive treatment for patients with advanced disease. Additionally, under the current fee-for-service environment, providers are paid based on the quantity, rather than the quality, of services delivered. This creates financial incentives for providers to deliver low-value, high-cost, and high-intensity services, even at the end of life. For example, Vera-Llonch et al. estimated total healthcare spending at nearly \$126,000 and \$129,000 for patients receiving chemotherapy for metastatic lung cancer and metastatic breast cancer, respectively [54, 55]. Additionally, in a study of patients with stage IV breast, colon, lung, and prostate cancers, Hu et al. determined that one-third of patients received a high-cost advanced imaging study (computerized tomography or CT, magnetic resonance imaging or MRI, positron emission tomography or PET, and nuclear medicine or NM) in the last month of life, with the

top 10 % receiving three of these imaging studies in the last month of life [56]. Moreover, research from the Dartmouth Atlas Project suggests that Medicare beneficiaries with terminal cancer receive overly aggressive treatment at the end of life, with 29 % dying in an acute care setting [57]. Aggressive treatment at the end of life is not associated with better survival, quality of life, or access to care, but it contributes to unsustainable national healthcare spending on end-of-life care. Since Americans have ranked treatment costs and financial burden to family members as their biggest concerns when faced with a life-limiting illness [58, 59], healthcare costs exacerbate emotional distress among patients with a poor prognosis.

Significant variation in end-of-life costs has been observed between geographic areas and between hospitals, and a seminal study by the Dartmouth Atlas Project identified the availability of healthcare resources, rather than patient acuity or patient preference, as the most significant contributing factor [60]. Moreover, in 2013, a committee convened by the Institute of Medicine (IOM) found that variation in acute care and post-acute care contributed to 89 % of variation in total Medicare spending [61]. This has important implications for the overutilization of services at the end of life (including ED visits) and suggests that better care coordination may reduce spending for these patients.

Patient Dissatisfaction with Emergency Care

Overcrowding, poor patient handoffs, and extended wait times—perceived and actual—in the ED compromise patient experience and contribute to patients leaving the ED without being seen [39, 62–64]. Historically, patient experience with ED care has not been systematically measured in the USA. However, a number of studies in the USA and abroad have attempted to identify factors that influence patient satisfaction (and dissatisfaction) with emergency care. The findings are mixed [65–67]. Provider communication, courtesy, empathy, and competence, together with patient perception regarding wait time, have been associated with overall satisfaction [67–69]. Because ED physicians often lack an established relationship with patients and because they balance multiple patients of varying acuity, they face significant challenges to timely and accurate communication [70]. Therefore, patient satisfaction may be improved by expanding ED provider access to patient records across care delivery systems and by training ED providers to initiate more frequent and targeted communication, particularly regarding wait times.

Some studies have shown higher satisfaction among ED patients of higher acuity (and vice versa) [71–73]. Additionally, lower-acuity patients have expressed greater dissatisfaction with wait times and costs of care than their higher-acuity counterparts [72]. This difference may be

attributed to two factors. First, urgent or emergent ED patients likely will be triaged more quickly than their nonurgent counterparts. Second, the fact that lower-acuity patients could be seen more quickly—and at a lower cost—in an outpatient setting may contribute to their dissatisfaction. Redirecting lower-acuity patients from the ED to more appropriate outpatient settings may help address this issue.

In 2012, the Centers for Medicare & Medicaid Services (CMS) contracted with the RAND Corporation to develop and validate a Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey for emergency care—the Emergency Department Patient Experience of Care (EDPEC) Survey. Three preliminary survey instruments were developed, based on patient disposition (i.e., discharge to the community vs. hospital admission). These instruments include four composites that measure patient experience with timeliness of care, communication regarding medications, physician and nurse communication, and discharge communication. Of note, preliminary testing identified poorer experience with provider attentiveness and communication among patients discharged to the community when compared to their counterparts that were admitted to an inpatient setting [74]. Clearly, further testing is needed to understand these differences in patient experience. Following further validation and adoption by CMS, these surveys likely will yield important findings regarding patient experience with ED care.

Caregiver Burden

Family caregivers experience significant financial, social, physical, and psychological distress while caring for relatives with debilitating and chronic conditions, such as cancer. As cancer care continues to shift to the outpatient setting, caregivers face increasing pressure to help their loved one navigate a complex and fragmented care delivery system and to manage much of their loved one's burden of treatment and disease at home while receiving limited training and support [75]. In a 2011 survey conducted by AARP, Inc. and the United Hospital Fund, 46 % of caregivers of patients with multiple chronic conditions reported performing medical care (e.g., medication management and operating specialized medical equipment) for their loved one. Additionally, 53 % of caregivers reported serving as care coordinators [76]. To prepare family members to meet the demands of their caregiver role, the IOM recommended that healthcare agencies, including the Department of Health and Human Services (HHS), fund demonstration projects to train caregivers of cancer patients for their demanding role [75].

Several studies have described morbidity in caregivers of cancer patients [77–79]. For example, Braun et al. reported significant symptoms of depression in nearly 39 % of caregivers of patients with advanced cancer [80]. Moreover,

Grunfeld et al. observed that caregivers of patients with advanced breast cancer experienced anxiety and depression that were equal to or greater than the patient's anxiety and depression [81]. Place of death was also shown to affect caregiver well-being. Wright et al. associated ICU death and inpatient death with increased caregiver risk for post-traumatic stress disorder and prolonged grief disorder, respectively, when compared with death at home [82]. Researchers have also described lifestyle interference among caregivers of cancer patients. Wadhwa et al. determined that 25 % of caregivers experienced a change in work status while caring for someone with advanced cancer [83]. Furthermore, Mazanec et al. estimated a 23 % loss of work productivity among caregivers [84]. This is problematic, since increased lifestyle interference due to caregiver duties increases caregiver emotional distress [85]. High stress among caregivers can interfere with their ability to provide logistical and emotional support to the cancer patient [86]. Caregiver emotional distress can also negatively affect the patient's well-being. Through two longitudinal studies of partners of breast cancer patients, Segrin et al. observed increased fatigue, symptom distress, anxiety, and depression among patients as emotional distress among caregivers increased [87, 88]. Therefore, it is essential for providers to assess patient and caregiver emotional well-being, burden, unmet needs, and social support through routine monitoring and to provide targeted psychosocial support for patients and their caregivers throughout the continuum of care. Additionally, it is imperative for professional and patient advocacy organizations to develop educational materials and support programs to help caregivers manage their distress.

Specific Issues for Dedicated Oncologic EDs

Dedicated oncologic EDs face additional pressures to coordinate care. For example, some patients with a cancer diagnosis seek entry to a free-standing cancer center [89] or another National Cancer Institute-designated comprehensive cancer center [90] through a dedicated ED at that center, if one exists. Thus, for some cancer patients, the ED serves as an interface or gateway into specialized oncology care systems. However, entry into a dedicated oncology ED is no guarantee of access to oncology care. Additionally, EDs at other hospitals may seek to transfer an uninsured or underinsured cancer patient to a specialized cancer center through its dedicated ED on the basis of an oncologic emergency that the transferring center is unable to manage. While the receiving ED has the duty to screen and stabilize the patient in the ED, there is no duty to admit the patient, once stabilized, for further treatment of the patient's health issue or underlying cancer. Thus, cancer patients may be bounced between multiple care settings, placing them at greater risk for receiving unsafe and poorly coordinated care.

Upstream Drivers

In the preceding section of this chapter, we discussed six quality issues affecting oncologic emergency care. We also described specific issues for dedicated oncologic EDs. Often, these issues arise when cancer patients seek ED care, but they are more directly associated with care delivery issues in the primary care setting or with inadequate access to care. Six upstream drivers that compromise ED-based oncology care are described below: (1) poor care coordination, (2) underutilized advance care planning, (3) inadequate access to palliative care, (4) delayed hospice referral and the hospice reimbursement model, (5) limited availability of immediate and after-hours outpatient care, and (6) unrealistic patient/caregiver expectations regarding prognosis and treatment.

Poor Care Coordination

Fragmented healthcare delivery and poor care coordination are well documented for the elderly, for the uninsured and underinsured, and for patients with chronic and life-threatening conditions. Because cancer patients frequently move between care settings—including oncology care, primary care, community and specialty hospitals, EDs, hospice, and long-term care—their treatment is often fragmented. Yet, strong care coordination is imperative for superior management of a complex disease, such as cancer, where care is typically delivered by multiple providers and, increasingly, on an outpatient basis. Outpatient intravenous chemotherapy and radiation therapy are delivered to an estimated 1.1 million Americans each year [91]. Moreover, increasing numbers of complex procedures, such as bone marrow transplant, stem cell transplant, and mastectomy without immediate reconstruction, are performed in the outpatient setting. Shifting these services to outpatient settings has many benefits for patients, reduces healthcare costs, and eases the demand for inpatient resources. However, it places patients at increased risk for unmanaged pain, infection, febrile neutropenia, anemia, dehydration, nausea and vomiting, gastrointestinal distress, and dyspnea that lead patients to seek care in the ED. Thus, ED visits and, in particular, repeat ED visits indicate that patient needs are unmet elsewhere, such as in the outpatient setting, or that caregivers are unprepared to care for their loved one's disease at home. This is principally true at the end of life, where cancer patients with poorly managed symptoms or with symptom distress associated with progression of disease frequently present at the ED.

Inadequate care coordination by the primary oncology team places ED care teams in the challenging and unlikely role of oncology care coordinator. However, as previously noted, ED physicians are trained to manage acute injury and illness and to stabilize patients for further treatment. Moreover, many ED physicians are uncomfortable with

addressing end-of-life issues in cancer patients [64]. Therefore, inadequate coordination in other care settings places added pressure on overextended ED physicians to ensure that they direct patients to appropriate follow-up care (including hospice or palliative care) and to connect with patients' primary care physicians and oncology providers.

Underutilized Advance Care Planning

Advance care planning allows patients to consider their end-of-life preferences, to communicate those preferences to their family members, caregivers, and healthcare providers, and to document their preferences regarding life-sustaining procedures in a legally binding advance directive. Ideally, advance care planning begins during treatment planning and is revisited periodically throughout treatment and if the patient's prognosis worsens. For cancer patients, it should include ongoing communication between patients, caregivers, and providers across care delivery settings in order to tailor treatment choices (including decisions regarding the intensity of care at the end of life) to align with patient goals and preferences. The National Comprehensive Cancer Network (NCCN) recommends initiating advance care planning for patients with a life expectancy of 1 year or less [92]. For patients with advanced disease, advance care planning is critical to delivering patient-centered care and is essential to align treatment plans with patient values and preferences for quality of life, treatment intensity, and life-prolonging treatment. Early findings indicate that advance care planning has several benefits: reduced aggressive treatment and increased hospice referral at the end of life [93], better alignment between patient preferences and care at the end of life [94], and improved satisfaction and reduced stress and anxiety for patients and their families [95].

Despite the potential benefits of advance care planning, end-of-life care discussions are often delayed until death is imminent [96] and all curative treatment options are exhausted [97]. Furthermore, researchers have observed large proportions of cancer patients presenting to the ED without an advance directive [98, 99]. Even when patients have an advance directive, its usefulness in the emergency care setting is limited if the ED care team is unaware of its existence or lacks access to it. With the sudden onset of an acute, life-threatening illness or critical decline of health status, the absence of, or delayed access to, a patient's advance directive may prevent the ED team from honoring patient wishes regarding life-prolonging treatment since these patients frequently are unable to communicate their wishes to their ED care team.

Of note, efforts to improve advancing care planning have focused on executing advance directives for patients with poor prognosis. Completion of advance directives is an integral component of advance care planning. However, advance care planning is much broader and includes thoughtful con-

sideration of patient preferences regarding life-sustaining procedures and place of death as well as treatment intensity and quality of life at the end of life. Thus, future efforts should focus on implementing coordinated, systematic, and patient-centered approaches to initiate advance care planning much earlier in the trajectory of disease, especially for patients with later-stage diagnoses.

Inadequate Access to Palliative Care

Palliative care can ease the burden of cancer throughout the continuum of care by addressing the physical and psychosocial effects of the disease and its treatment. Researchers propose that early palliative care initiation improves symptom management and quality of life [100, 101] while reducing healthcare spending and utilization of acute care and emergency services [102–104]. It has also been associated with improved survival in some patients [105], whereas poor health-related quality of life has been associated with poorer survival [106–109]. Moreover, early palliative care referral has been associated with more realistic expectations regarding cancer prognosis [110]. Despite recent growth in palliative care programs across the USA [111, 112], most palliative care programs are inpatient-based, and outpatient palliative care clinics are offered more frequently in National Cancer Institute-designated cancer centers [111, 112]. Therefore, palliative care services are not readily accessible for many cancer patients. Additionally, palliative care referrals may be delayed due to perceptions among oncologists that palliative care and curative treatment must follow sequential, rather than concurrent, pathways [113]. Consequently, palliative care needs often are unmet in the healthcare system and in the ED, and patients with distress associated with advanced disease or high symptom burden frequently seek care in the ED, particularly at the end of life.

To reduce barriers to timely palliative care, experts have recommended integrating palliative care with ED services [114–116]. However, the benefits of ED-based palliative care are as yet unproven, and researchers have identified several barriers to integrating palliative care practice in the ED; these include inadequate palliative care training, an ED culture that favors aggressive treatment, and provider fear of being sued [117, 118]. This highlights opportunities for health services research to investigate formally the barriers to ED-based palliative care and to test strategies to address those barriers. Four research priorities were defined in 2009 by a joint workgroup of the Agency for Healthcare Research and Quality (AHRQ) and the American College of Emergency Physicians (ACEP):

1. Which patients are in greatest need of palliative care services in the ED?
2. What is the optimal role of emergency clinicians in caring for patients along a chronic trajectory of illness?

3. How does the integration and initiation of palliative care training and services in the ED setting affect healthcare utilization?
4. What are the educational priorities for emergency clinical providers in the domain of palliative care? [119]

Focused research in these areas will reveal potential clinical and economic benefits of ED-based palliative care and can help expedite the development of validated models for integrating palliative care with ED services. Moreover, continued experimentation with, and early adoption of, best practices and guidelines for ED-based palliative care, such as those made available through the *Improving Palliative Care in Emergency Medicine* (IPAL-EM) initiative, will provide important insights into the benefits of and roadblocks to delivering ED-based palliative care [120].

Delayed Hospice Referral and the Hospice Reimbursement Model

Hospice programs can deliver excellent end-of-life care for cancer patients with a life expectancy of 6 months or less. Ideally, these programs offer team-based comprehensive and interdisciplinary palliative care in the patient's home, thereby maximizing patient comfort and quality of life at the end of life. Electing hospice care requires patients to forgo curative treatment and is an appropriate choice for patients with poor prognosis or when the risks or complications of treatment outweigh the potential benefits. Hospice referrals have increased significantly since the Medicare hospice benefit was created by the Tax Equity and Fiscal Responsibility Act of 1982 [121], with 1.27 million Medicare beneficiaries receiving hospice services in 2012. From 2000 to 2012, hospice enrollment among Medicare decedents more than doubled (from 22.9 % in 2000 to 46.7 % in 2012). The timing of hospice referral, although delayed, has also improved. Average length of hospice stay for Medicare decedents was 88 days in 2012 vs. 54 days in 2000. Median length of hospice stay remained relatively stable, however (18 days in 2012 vs. 17 days in 2000). This indicates longer hospice stays for patients with the longest hospice stays, along with opportunities to extend hospice stays for all enrolled beneficiaries—principally for cancer patients. Moreover, it indicates that many patients are enrolling in hospice too late to benefit fully from the team-based comprehensive and interdisciplinary palliative care that hospice programs offer. In 2012, cancer patients continued to lag behind non-cancer patients, with average length of hospice stay at 51 days for cancer patients vs. 139 days and 112 days for patients with neurological conditions and chronic obstructive pulmonary disease, respectively. Likewise, the share of hospice decedents with cancer declined from 52 to 32 % between 2000 and 2012 [122]. These findings highlight opportunities to introduce hospice referral earlier for patients with a terminal cancer diagnosis.

Several barriers have been identified to earlier hospice referral. These include patient and family difficulty accepting a terminal cancer prognosis, provider discomfort with introducing end-of-life discussions, and financial incentives to keep patients in the acute care system [122]. Desired intensity of care also represents a significant barrier to earlier hospice enrollment due to the eligibility criteria and benefit design. In the USA, hospice care delivery is largely defined by the Medicare Hospice Benefit. To qualify for the Medicare Hospice Benefit, patients must have a life expectancy of 6 months or less (as certified by two physicians) and must agree to forgo curative treatment. Once patients are enrolled, Medicare pays hospice providers a per diem rate per enrollee—\$156/day base payment rate for routine home care and \$694/day base payment rate for general inpatient care in 2014—regardless of the intensity of care required by the patient [122]. Hospice providers then assume financial responsibility for all care related to the patient's terminal illness. Patients with advanced cancer often benefit from palliative radiation and chemotherapy, opioids, and parenteral nutrition. These treatment costs may be substantial [123] and may greatly exceed the Medicare Hospice Benefit. Accordingly, hospice providers may be discouraged from enrolling high-cost cancer patients [124]. Many hospice providers have implemented restrictive enrollment policies aimed at reducing these costs. A 2008–2009 survey of US hospice providers found that 55 % of respondents restricted total parenteral nutrition, while 61 and 30 % of respondents restricted chemotherapy and palliative radiation, respectively [124]. These restrictions present many patients and caregivers with the dilemma of electing hospice care or comfort care at the end of life [123].

The ACA mandated a 3-year pilot of concurrent hospice and traditional care to determine its effect on the quality and costs of care [125]. As of 2014, this demonstration project has not been funded. However, Aetna conducted a similar pilot—extending hospice eligibility to patients with a life expectancy of 12 months or less—and observed increased hospice enrollment, lower utilization of acute care services, and a 22 % reduction in costs [126]. Additional demonstration projects should be conducted to help public and private payers design benefits that promote better quality of life, appropriately timed hospice enrollment, and, where appropriate, integrated hospice and acute care delivery.

Limited Availability of Immediate and After-Hours Outpatient Care

Experts suggest that many ED visits are for non-emergent complaints that could be effectively and affordably managed in the outpatient setting. For example, Hansagi et al. observed that two-thirds of ED patients in their study were primary care cases, but the patients could not get in to see their physician or were referred to the ED for care [71]. Similarly, Mayer et al. conducted an observational study of ED visits in North

Carolina and found that 44.9 % of ED visits occurred during normal clinic hours. Less than one-fifth of those patients were admitted to the hospital [127]. These findings suggest opportunities to manage these patients by providing more immediate access to outpatient oncology care, such as through same-day/next-day appointments or 24/7 provider access.

The effectiveness of these practices is being tested through oncology-specific patient-centered medical homes (PCMH). The PCMH is a primary care delivery model designed to provide comprehensive, well-coordinated, patient-centered care (including preventive, chronic, and acute care) by promoting access to care and a systems-based approach to safety and quality [128]. When applied to oncology, this model is proposed to support integrated primary and oncology care in the community setting. Consultants in Medical Oncology and Hematology (CMOH) is the first oncology practice designated as a level III PCMH by the National Committee for Quality Assurance (NCQA). CMOH began reengineering its processes in 2004 to improve patient engagement and symptom management. CMOH experienced a 68 % decrease in ED referrals by 2010, due to the following interventions: expanded patient access to clinical staff, standardized patient assessments, patient empowerment, and utilization of advanced health information technology (health IT or HIT), including an oncology-specific electronic health record (EHR) and a telephone triage system [129, 130]. A broader pilot—Community Oncology Medical HOME (COME HOME)—is now underway with funding from the CMS Innovation Center [131]. COME HOME is piloting similar approaches, such as 24/7 provider access and a telephone triage system, to deliver more coordinated cancer care. The findings of the COME HOME pilot, together with CMOH's experience, should be studied to determine the generalizability of these approaches to cancer care in the community and at academic medical centers.

Unrealistic Patient/Caregiver Expectations Regarding Prognosis and Treatment

Patient preference regarding treatment intensity is influenced by health literacy, provider mistrust, family dynamics, religious beliefs, and other cultural and religious factors [132, 133]. For cancer patients to make treatment decisions that are consistent with their preferences and values, they must have an accurate understanding of their treatment options and prognosis. Moreover, this is essential to reduce unnecessary and futile care, since patients who understand their prognosis prefer symptom-directed care [94], whereas patients that overestimate their prognosis are more likely to receive aggressive treatment of questionable benefit [134]. A number of studies have confirmed that patients with advanced disease frequently overestimate their prognosis or misunderstand the intent of their cancer treatment [101, 135–138]. For example, Temel et al. published a study of newly

diagnosed patients with metastatic lung cancer in 2011, noting that 32 % of respondents considered their cancer curable and that 69 % of respondents believed they were receiving curative, rather than palliative, treatment [110]. Likewise, Weeks et al. reported that 69 and 81 % of patients with metastatic lung and colorectal cancer, respectively, did not understand that they were receiving palliative chemotherapy [139].

Patient and caregiver misunderstandings about prognosis or treatment intent reflect communication challenges between patients, their caregivers, and providers. In some cases, patients receive accurate prognostic information, but do not understand or do not accept their prognosis. In other cases, physicians may be reluctant to provide this information, will do so only when asked by the patient, or will provide inflated survival estimates to their patients [136, 138–140]. Mack and Smith attributed provider communication issues to discomfort with these discussions and concerns regarding patient depression, reduced hope, cultural appropriateness, and uncertainty in estimating prognosis [141]. In 2013, the IOM recommended five strategies for improving patient-centered communication and shared decision-making for cancer patients:

1. Making more comprehensive and understandable information available to patients and their families.
2. Developing decision aids to facilitate patient-centered communication and shared decision-making.
3. Prioritizing clinician training in communication.
4. Preparing cancer care plans.
5. Using new models of payment to incentivize patient-centered communication and shared decision-making [75].

Implementing these approaches will assist providers in communicating prognosis and treatment intent and would contribute to more realistic assessments among patients and their caregivers. Most importantly, physicians should seek to understand their patients' preferences for prognostic information and adapt their communication styles accordingly.

Role of Quality Measures

Healthcare quality measures provide objective and subjective assessments of the consequences of healthcare, transforming medical practical into a quantitative discipline. Experts have developed quality measures to evaluate multiple components of care, including the underlying structures and processes of care as well as the outcomes of care and, to a limited degree, the costs of care. Moreover, there is continued interest in measuring patient experience with care and, increasingly, caregiver burden and experience with care. Some measures are developed for a specific health condition (e.g., breast cancer) or care delivery setting (e.g., ED). Other measures are crosscutting, applying to a variety of health conditions or care delivery settings.

In this section, we describe the history of quality measurement in emergency medicine, provide examples of existing ED quality measures that are relevant to cancer care, and discuss the limitations of these measures.

History of Quality Measurement in Emergency Medicine

National quality measurement for emergency medicine began in the early 2000s as part of CMS' Reporting Hospital Quality Data for Annual Payment Update (RHQDAPU) program. The RHQDAPU program was a voluntary CMS quality reporting program that became the Inpatient Quality Reporting (IQR) program in 2010. The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) introduced financial incentives for hospitals to report data on ten quality measures for pneumonia, acute myocardial infarction (AMI), and congestive heart failure via the RHQDAPU program [142, 143]. These measures were developed through the Hospital Quality Alliance, a public/private partnership whose members included CMS, the Joint Commission, the American Hospital Association, and healthcare consumer groups [144]. In 2004, these data were published as the first national comparative dataset for ED quality. The financial incentives created under the MMA were later strengthened by the Deficit Reduction Act of 2005 (DRA) [145] and expanded to include measures for hospital-based outpatient care under the Tax Relief and Health Care Act of 2006 [146].

Subsequent public and private sector efforts have also focused on enhancing ED quality measurement. For example, in 2006, the American Medical Association's Physician Consortium for Performance Improvement (AMA-PCPI), ACEP, and NCQA jointly developed physician-level ED measures for pneumonia, chest pain, and syncope [147, 148]. Additional independent measure development projects were undertaken by hospitals, by CMS, and by professional organizations, such as ACEP. These efforts focused on specific aspects of care (e.g., timeliness of care and ED communication). Attention was also directed toward disease-specific measures of morbidity, mortality, and resource use [148–151]. Likewise, two Performance Measures and Benchmarking Summits were convened in 2006 and 2010, and participants proposed a wide range of metrics: operational metrics (e.g., ED census), timestamp and interval metrics (e.g., ED length of stay), proportional metrics (e.g., left without being seen), and utilization metrics (e.g., specialty consultations) [152, 153]. More recently, Stone-Griffith et al. developed the ED Dashboard and Reporting Application to support data-driven ED performance improvement projects by routinely measuring ED throughput [154].

In parallel, the National Quality Forum (NQF) launched a two-phase project endorsing a national measure set for ED care. The NQF is a nonprofit organization that uses a consen-

sus development process to endorse healthcare quality measures for use in federal public reporting programs. Between 2007 and 2009, the NQF endorsed 22 measures for ED care, including nine measures that were given time-limited endorsement (temporary endorsement, pending completion of measure testing and validation) [149, 155]. These measures are included in Table 1. Some of these measures were adopted for CMS public reporting programs, including the IQR program, Meaningful Use (MU) Stage 2 EHR Incentive Program, Outpatient Quality Reporting (OQR) program, and Physician Quality Reporting System (PQRS) program. Over time, many of these measures have been retired from these federal reporting programs or are no longer endorsed by the NQF [156]. As of January 2015, there are 24 ED quality measures endorsed by the NQF, including 11 ED quality measures used in CMS reporting programs (Table 1). ED measures relevant to cancer care and the limitations of those measures are summarized in the following section and in Table 2.

Limitations of Existing Quality Measures for Emergency Departments

Despite the ED measure development efforts to date, existing measures have substantial limitations. For example, ED measures have been incorporated in federal public reporting programs, including the IQR, MU, OQR, and PQRS programs. However, there is no nationally mandated public reporting program specific to emergency care. Hence, patients lack a clear, dependable resource for information on ED provider performance. Additionally, the ED measures currently collected and publicly reported by CMS are largely provider-oriented, reflect fragmented care delivery, and lack a clear method to address upstream care delivery challenges that often present in the ED. Due to these factors, current reporting efforts offer limited potential to improve substantially the quality of ED care for cancer patients. Five limitations of ED quality measurement in the USA are briefly discussed below: (1) gaps in existing ED measures, (2) fragmented measure development, (3) difficulty defining an episode of oncologic emergency care, (4) measurement without a clear mechanism for improving ED care, and (5) challenges in obtaining ED quality data.

Gaps in Existing ED Measures

A robust ED measure set for cancer patients should assess multiple dimensions of oncologic emergency care, such as access to care, care coordination, advance care planning, patient and family engagement, and evaluation and management of acute and chronic conditions and psychosocial needs. Routine measurement of the outcomes and costs of care as well as appropriate resource utilization is also essential. Yet, no existing measure set or quality reporting program adequately measures these aspects of oncologic emergency care. As noted above, 24 ED quality measures are

endorsed by the NQF as of January 2015. Thirteen of these measures are relevant to cancer care, including one cancer-specific measure. An additional ED measure has been developed specifically for cancer care, but it has not been endorsed by the NQF. Current ED measurement gaps relevant to cancer care span all measure categories (i.e., outcomes, structure, process, cost-of-care, efficiency, and patients' perception-of-care) and include cancer-specific ED measures. These measurement gaps, together with recommendations to address these gaps, are summarized in Table 2.

Fragmented Measure Development

Historically, ED measure development efforts in the USA were academic-led and focused on specific patient populations or clinical conditions. These initiatives were conducted independently of payers and state and federal agencies, leading to a "patchwork of measures" for ED care [148]. These independent measure development efforts have contributed to the fragmented ED quality measurement observed today, which undermines efforts to deliver high-quality, patient-centered care. With the exception of AMI ED measures (e.g., NQF measure #0286—*Aspirin at Arrival*), which have been adopted in several public reporting and reimbursement programs, the existing measures have not been widely adopted by providers or payers [148]. Thus, most ED care is not routinely measured, and existing quality measures provide an incomplete view of the nation's ED system. A well-coordinated approach to developing ED quality of care measures for oncology is discussed later in this chapter.

Difficulty Defining an Episode of Oncologic Emergency Care

Defining an episode of emergency care is challenging for most conditions, since the expected prognosis, treatment time, and time to recovery can vary greatly by condition and across patients. Moreover, patients can receive care for their acute health event from multiple providers and across multiple care settings, all of which contribute to the patient's final health outcome [31]. For cancer patients, defining standardized episodes of emergency care is problematic for two reasons. First, cancer patients move frequently—and often unpredictably—between care settings throughout the continuum of care. Therefore, cancer patients may present to the ED before diagnosis (for late-stage cancers presenting to the ED), at any point during treatment, and at the end of life. Second, the sequelae of cancer and its treatment vary greatly across patients. Therefore, cancer patients can present to the ED with symptoms of varying severity, ranging from moderate dehydration to life-threatening sepsis, making it difficult to standardize oncologic emergency treatment pathways across patients. Because episodes of oncologic emergency care can vary so greatly across patients, it is difficult to develop quality measures and appropriate benchmarks for care. Focused

health service research is needed to develop episodes of oncologic emergency care with well-defined endpoints to support the development of relevant quality measures for this setting.

Measurement Without a Clear Mechanism for Improving Care

Quality measures designed for performance improvement and accountability should align with evidence-based guidelines, be actionable by clinicians, and have a clearly defined relationship with patient outcomes. Moreover, measures should be reported publicly to inform healthcare consumers and to drive improvements in care. Public reporting of ED performance data has been proposed as a critical lever for improving the nation's emergency care system [31]. Experience with publicly reported ED measures has produced mixed results, however. Some public reporting initiatives (e.g., AMI performance measures) have led to significant improvements in care, while others (e.g., pneumonia performance measures) have yielded disappointing results or—even worse—poorer quality of care. In those cases, the measures were misaligned with the existing guidelines, were based on weak evidence, or included arbitrary time points [148]. These factors limit the utility of existing quality measures to support meaningful improvements in care.

Faulty or unclear provider attribution can also impede efforts to address quality of care issues. For example, NQF measure #0211—*Proportion with more than one emergency department visit in the last days of life*—is designed for reporting by hospitals and acute care facilities. However, as previously described, end-of-life ED visits can be associated with poor care coordination or inadequate symptom management in other settings. Therefore, ED reporting of this important end-of-life measure will fail to uncover—and ultimately improve—quality of care issues in upstream care settings and may lead to erroneous conclusions regarding the quality of care in some EDs. Furthermore, because cancer patients move between a variety of care settings, multiple providers and care settings share responsibility for their outcomes of care. Ideally, existing quality measurement programs could be leveraged to measure the quality of care across providers and care settings. However, the current programs are too narrowly focused to support a broad, system-level approach to measuring the quality of emergency care. Currently, federal quality reporting programs are organized around CMS' payment programs (e.g., the PQRS program applies to physician payments under the Medicare Physician Fee Schedule.). Measures in these programs often leverage administrative claims data, which differ between physician and hospital payment programs. Thus, ED quality measures adopted for the PQRS program (e.g., NQF measure #0092—*Emergency Medicine: Aspirin at Arrival for Acute Myocardial Infarction (AMI)*) are not easily applied to hospital-level reporting, which limits their ability to improve

Table 1 NQF-endorsed measures for emergency care: past and present

NQF ID	Measure title (1)	Measure description (1)	Reporting level	Measure owner (1, 2)	Measure target (type) (1)	Year endorsed	Current status	CMS program (3)	Relevant to cancer care? (4)
0025	Management plan for people with asthma	Percentage of patients for whom there is documentation that a written asthma management plan was provided either to the patient or the patient's caregiver OR, at a minimum, specific written instructions on under what conditions the patient's doctor should be contacted or the patient should go to the emergency department	Clinician	IPRO	Asthma (process)	2009	Endorsement removed (<i>Oct 2012</i>)		No
0090	Emergency Medicine: 12-Lead Electrocardiogram (ECG) Performed for Non-Traumatic Chest Pain	Type of score: proportion percentage of patients aged 40 years and older with an emergency department discharge diagnosis of non-traumatic chest pain who had an ECG performed	Clinician	AMA-PCPI	Cardiovascular (process)	2007	Endorsed	PQRS	No
0092	Emergency Medicine: Aspirin at Arrival for Acute Myocardial Infarction (AMI)	Type of score: proportion percentage of patients, regardless of age, with an emergency department discharge diagnosis of AMI who had documentation of receiving aspirin within 24 h before emergency department arrival or during emergency department stay	Clinician	AMA-PCPI	Cardiovascular (process)	2007	Endorsed	PQRS	No
0093	Emergency Medicine: 12-Lead Electrocardiogram (ECG) Performed for Syncope	Type of score: proportion percentage of patients aged 60 years and older with an emergency department discharge diagnosis of syncope who had an ECG performed	Clinician	AMA-PCPI	Cardiovascular (process)	2007 (6)	Endorsement removed (<i>Feb 2014</i>)	PQRS	No
0094	Assessment of Oxygen Saturation for Community-Acquired Bacterial Pneumonia	Percentage of patients aged 18 years and older with the diagnosis of community-acquired bacterial pneumonia with oxygen saturation assessed	Clinician	AMA-PCPI	Pneumonia (process)	2007 (6)	Endorsement removed (<i>Dec 2011</i>)		No
0095	Assessment Mental Status for Community-Acquired Bacterial Pneumonia	Percentage of patients aged 18 years and older with the diagnosis of community-acquired bacterial pneumonia with mental status assessed	Clinician	AMA-PCPI	Pneumonia (process)	2007 (6)	Endorsement removed (<i>Dec 2011</i>)		No
0148	Blood cultures performed in the emergency department prior to initial antibiotic received in hospital	Percentage of pneumonia patients 18 years of age and older who have had blood cultures performed in the emergency department prior to initial antibiotic received in hospital	Facility	CMS	Pneumonia (process)	2007	Endorsement removed (<i>Oct 2012</i>)	IQR; VBP	No
0151	Initial antibiotic received within 6 h of hospital arrival	Percentage of pneumonia patients 18 years of age and older who receive their first dose of antibiotics within 6 h after arrival at the hospital	Facility	CMS	Pneumonia (process)	2009	Endorsement removed (<i>Oct 2012</i>)		No

0211	Proportion with more than one emergency department visit in the last days of life	Percentage of patients who died from cancer with more than one emergency department visit in the last days of life	Population; health plan; integrated delivery system; facility; group; clinician	ASCO	Cancer-specific (process)	2009	Endorsed		Yes
0286	Aspirin at Arrival	Percentage of emergency department acute myocardial infarction (AMI) patients or chest pain patients (with probable cardiac chest pain) without aspirin contraindications who received aspirin within 24 h before ED arrival or prior to transfer	Population; facility	CMS	Cardiovascular (process)	2007 (5)	Endorsed	OQR	No
0287	Median Time to Fibrinolysis	Median time from emergency department arrival to administration of fibrinolytic therapy in ED patients with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to ED arrival and prior to transfer	Population; facility	CMS	Cardiovascular (process)	2007 (5)	Endorsement removed (<i>Jan 2012</i>)	OQR	No
0288	Fibrinolytic Therapy Received Within 30 Min of ED Arrival	Emergency department acute myocardial infarction (AMI) patients receiving fibrinolytic therapy during the ED stay and having a time from ED arrival to fibrinolysis of 30 min or less	Population; facility	CMS	Cardiovascular (process)	2007 (5)	Endorsed	OQR	No
0289	Median Time to ECG	Median time from emergency department arrival to ECG (performed in the ED prior to transfer) for acute myocardial infarction (AMI) or chest pain patients (with probable cardiac chest pain)	Population; facility	CMS	Cardiovascular (process)	2007 (5)	Endorsed	OQR	No
0290	Median Time to Transfer to Another Facility for Acute Coronary Intervention	Median time from emergency department arrival to time of transfer to another facility for acute coronary intervention	Population; facility	CMS	Cardiovascular (process)	2007 (5)	Endorsed	OQR	No
0291	Emergency Transfer Communication Measure	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that required information was communicated to the receiving facility prior to departure (Subsection 1) or within 60 min of transfer (Subsection 2–7)	Facility	UMRHRC	Care coordination (process)	2007 (5)	Endorsed		Yes
0292	Vital Signs	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that the entire vital signs record was communicated to the receiving facility within 60 min of departure	Facility	UMRHRC	Care coordination (process)	2007 (5)	Endorsed		Yes

(continued)

Table 1 (continued)

NQF ID	Measure title (1)	Measure description (1)	Reporting level	Measure owner (1, 2)	Measure target (type) (1)	Year endorsed	Current status	CMS program (3)	Relevant to cancer care? (4)
0293	Medication Information	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that medication information was communicated to the receiving facility within 60 min of departure	Facility	UMRHRC	Care coordination (process)	2007 (5)	Endorsed		Yes
0294	Patient Information	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that patient information was communicated to the receiving facility within 60 min of departure	Facility	UMRHRC	Care coordination (process)	2007 (5)	Endorsed		Yes
0295	Physician Information	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that physician information was communicated to the receiving facility within 60 min of departure	Facility	UMRHRC	Care coordination (process)	2007 (5)	Endorsed		Yes
0296	Nursing Information	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that nursing information was communicated to the receiving facility within 60 min of departure	Facility	UMRHRC	Care coordination (process)	2007 (5)	Endorsed		Yes
0297	Procedures and Tests	Percentage of patients transferred to another healthcare facility whose medical record documentation indicated that procedure and test information was communicated to the receiving facility within 60 min of departure	Facility	UMRHRC	Care coordination (process)	2007 (5)	Endorsed		Yes
0489	The Ability for Providers with HIT to Receive Laboratory Data Electronically Directly into their Qualified/Certified EHR System as Discrete Searchable Data Elements	Documents the extent to which a provider uses certified/qualified electronic health record (EHR) system that incorporates an electronic data interchange with one or more laboratories allowing for direct electronic transmission of laboratory data into the EHR as discrete searchable data elements	Facility	CMS	Care coordination (structure)	2008 (6)	Endorsement removed (Apr 2014)	OQR	Yes
0491	Tracking of Clinical Results Between Visits	Documentation of the extent to which a provider uses a certified/qualified electronic health record (EHR) system to track pending laboratory tests, diagnostic studies (including common preventive screenings) or patient referrals. The Electronic Health Record includes provider reminders when clinical results are not received within a predefined timeframe	Facility	CMS	Care coordination (structure)	2008 (6)	Endorsement removed (Apr 2014)		Yes

0495	Median Time from ED Arrival to ED Departure for Admitted ED Patients	Median time from emergency department arrival to time of departure from the emergency department for patients admitted to the facility from the emergency department	Facility	CMS	Care coordination (outcome)	2008 (5, 6)	Endorsed	IQR; MU	Yes
0496	Median Time from ED Arrival to ED Departure for Discharged ED Patients	Median time from emergency department arrival to time of departure from the emergency department for patients discharged from the emergency department	Facility	CMS	Care coordination (outcome)	2008 (5, 6)	Endorsed	MU; OQR	Yes
0497	Admit Decision Time to ED Departure Time for Admitted Patients	Median time from admit decision time to time of departure from the emergency department for emergency department patients admitted to inpatient status	Health Plan; facility; group; clinician	CMS	Care coordination (process)	2008 (5, 6)	Endorsed	IQR; MU	Yes
0498	Door to Diagnostic Evaluation by a Qualified Medical Personnel	Time of first contact in the ED to the time when the patient sees qualified medical personnel for patient evaluation and management	Facility; clinician	LSU	Care coordination (outcome)	2008 (5, 6)	Endorsement removed (May 2012)	OQR	Yes
0499	Left Without Being Seen	Percent of patients leaving without being seen by a qualified medical personnel	Facility; clinician	LSU	Care coordination (outcome)	2008 (5)	Endorsement removed (May 2012)	OQR	Yes
0500	Severe Sepsis and Septic Shock: Management Bundle	This measure will focus on patients aged 18 years and older who present with symptoms of severe sepsis or septic shock. These patients will be eligible for the 3 h (severe sepsis) and/or 6 h (septic shock) early management bundle	Integrated delivery system; facility	HFH	Disparities (outcome)	2008 (5, 6)	Endorsed		No
0501	Confirmation of Endotracheal Tube Placement	Any time an endotracheal tube is placed into a patient's airway in the emergency department (ED) or a patient arrives to the ED with an endotracheal tube already in place (via EMS or hospital transfer) there should be appropriate confirmation of ETT placement and documentation of its performance in the medical record	Population; integrated delivery system; facility; group; clinician	CCF	Pulmonary (process)	2008 (5, 6)	Endorsement removed (June 2012)		No
0502	Pregnancy test for female abdominal pain patients	Percentage of female patients aged 14 to 50 who present to the emergency department (ED) with a chief complaint of abdominal pain for whom a pregnancy test ordered	Facility; group; clinician	ACEP	Perinatal (process)	2008 (5, 6)	Endorsement removed (May 2012)		No
0503	Anticoagulation for acute pulmonary embolus patients	Number of acute embolus patients who have orders for anticoagulation (heparin or low-molecular weight heparin) for pulmonary embolus while in the ED	Facility; group; clinician	ACEP	Cardiovascular (process)	2008 (5, 6)	Endorsement removed (Jan 2013)	PQRS	No
0504	Pediatric weight documented in kilograms	Percentage of emergency department visits by patients < 18 years of age with a current weight documented in kilograms in the ED electronic health record; measure to be reported each month	Facility	AAP	Safety (process)	2008 (5, 6)	Endorsement removed (Jan 2013)		No

(continued)

Table 1 (continued)

NQF ID	Measure title (1)	Measure description (1)	Reporting level	Measure owner (1, 2)	Measure target (type) (1)	Year endorsed	Current status	CMS program (3)	Relevant to cancer care? (4)
0549	Pharmacotherapy Management of COPD Exacerbation (PCE)	This measure assesses the percentage of COPD exacerbations for members 40 years of age and older who had an acute inpatient discharge or ED encounter on or between January 1–November 30 of the measurement year and who were dispensed appropriate medications	Population; health plan; integrated delivery system; facility; group; clinician	NCQA	COPD (process)	2009	Endorsement removed (Jul 2012)		No
0604	Adult(s) with diabetes mellitus that had a serum creatinine in last 12 reported months	This measure identifies adults with diabetes mellitus that had a serum creatinine test in last 12 reported months	Population; health plan; integrated delivery system; facility; group; clinician	Optum	Endocrine (process)	2009	Endorsement removed (Dec 2013)		No
0605	Patient(s) with hypertension that had a serum creatinine in last 12 reported months	This measure identifies patients with hypertension (HTN) that had a serum creatinine in last 12 reported months	Population; health plan; integrated delivery system; facility; group; clinician	Optum	Cardiovascular (process)	2009	Endorsement removed (Dec 2013)		No
0644	Patients with a transient ischemic event ED visit that had a follow up office visit	Patient(s) with a recent emergency department encounter for a transient cerebral ischemic event that had any physician visit within 14 days of the acute event	Population; health plan; integrated delivery system; facility; group; clinician	Optum	Stroke (process)	2010	Endorsement removed (Mar 2013)		No
0649	Transition Record with Specified Elements Received by Discharged Patients (Emergency Department Discharges to Ambulatory Care [Home/Self Care] or Home Health Care)	Percentage of patients, regardless of age, discharged from an emergency department (ED) to ambulatory care or home health care, or their caregiver(s), who received a transition record at the time of ED discharge including, at a minimum, all of the specified elements	Integrated delivery system; facility	AMA-PCPI	Care coordination (process)	2010	Endorsed		Yes
0652	Rh immunoglobulin (Rhogam) for Rh negative pregnant women at risk of fetal blood exposure	Percent of Rh negative pregnant women at risk of fetal blood exposure who receive Rhogam [at] the ED	Group; clinician	ACEP	Perinatal (process)	2011	Endorsement removed (Jul 2014)	PQRS	No
0660	Troponin Results for Emergency Department acute myocardial infarction (AMI) patients or chest pain patients (with Probable Cardiac Chest Pain) Received within 60 min of arrival	Emergency department acute myocardial infarction (AMI) patients or chest pain patients (with probable cardiac chest pain) with an order for troponin during the stay and having a time from ED arrival to completion of troponin results within 60 min of arrival	Facility	CMS	Cardiovascular (process)	2011	Endorsement removed (Nov 2012)		No
0661	Head CT or MRI Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke Patients who Received Head CT or MRI Scan Interpretation Within 45 min of ED Arrival	Emergency department acute ischemic stroke or hemorrhagic stroke patients who arrive at the ED within 2 h of the onset of symptoms who have a head CT or MRI scan performed during the stay and having a time from ED arrival to interpretation of the head CT or MRI scan within 45 min of arrival	Population; facility	CMS	Stroke (process)	2011	Endorsed	OQR	No

Measure ID	Measure Description	Facility	CMS	Musculoskeletal (process)	2011	Endorsed	OQR	No
0662	Median Time to Pain Management for Long Bone Fracture	Facility	CMS	Musculoskeletal (process)	2011	Endorsed	OQR	No
0664	Patient(s) with an emergency medicine visit for syncope that had an ECG	Population; health plan; integrated delivery system; facility; group; clinician	Optum	Cardiovascular (process)	2011	Endorsement removed (Dec 2013)		No
0665	Patient(s) with an emergency medicine visit for non-traumatic chest pain that had an ECG	Population; health plan; integrated delivery system; facility; group; clinician	Optum	Cardiovascular (process)	2011	Endorsement removed (Dec 2013)		No
0666	Ultrasound guidance for Internal Jugular central venous catheter placement	Group; clinician	ACEP	Pulmonary (process)	2011	Endorsed		No
0667	Inappropriate Pulmonary CT Imaging for Patients at Low Risk for Pulmonary Embolism	Facility; group; clinician	ACEP	Pulmonary (efficiency)	2011	Endorsed		No
1381	Asthma Emergency Department Visits	Population; health plan	ALMA	Asthma (outcome)	2011	Endorsement removed (Feb 2014)		No
1824	L1A: Screening for preferred spoken language for health care	Facility; group; clinician	GWU	Disparities (process)	2012	Endorsed		Yes

Source: This table is based on the authors' analysis of ED quality measures that are endorsed as of January 2015 or were previously endorsed by the NQF, including measures used in CMS reporting programs. [156]

Note:

- The measure titles, descriptions, and owners in this table are based on the information listed on the NQF website as of January 2015 [156]. These fields may differ from the measure titles, descriptions, and owners when the measures were initially endorsed by the NQF
- Measure owners are listed below: AAP - American Academy of Pediatrics (www.aap.org/); ACEP - American College of Emergency Physicians (www.acep.org/); ALMA - Alabama Medicaid Agency (www.medicare.alabama.gov/); AMA-PCPI - American Medical Association - Physician Consortium for Performance Improvement (www.ama-assn.org/ama/home.page); ASCO - American Society of Clinical Oncology (www.asco.org/); CCF - Cleveland Clinic Foundation (<http://my.clevelandclinic.org/>); CMS - Centers for Medicare & Medicaid Services (www.cms.gov/); GWU - Department of Health Policy, The George Washington University (<http://publichealth.gwu.edu/departments/health-policy/>); HFH - Henry Ford Hospital (www.henryford.com/homepage_hfh.cfm?id=37471); IPRO (<http://ipro.org/>); LSU - Louisiana State University (www.lsuhealth.com/); NCQA - National Committee for Quality Assurance (www.ncqa.org/); Optum (<https://www.optum.com/>); UMRHRC - University of Minnesota Rural Health Research Center (<http://rhrcc.umn.edu/>)
- CMS public reporting programs are listed below: IQR - Inpatient Quality Reporting (www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQuality/Inits/HospitalRHQDAPU.html); MU - Meaningful Use Stage 2 EHR Incentive Program (www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Stage_2.html); OQR - Outpatient Quality Reporting System (www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/index.html)
- Relevance to cancer care is based on the authors' analysis of the measure specifications. Some measures (e.g., NQF #0090-Emergency Medicine: 12-Lead Electrocardiogram (ECG) Performed for Non-Traumatic Chest Pain) may apply to cancer patients with other comorbidities as well as health status changes. However, the measures are not directly relevant to cancer care
- ED measures endorsed by the NQF between 2007 and 2009 based on the NQF report: National Voluntary Consensus Standards for Emergency Care: A Consensus Report. [149]
- Measure was given time-limited endorsement. Time-limited endorsement is granted to measures that meet NQF evaluation criteria, but have not been adequately field-tested. Measure developers are given up to 2 years to demonstrate the reliability, validity, and feasibility of the measure based on testing at multiple provider sites [155]

Table 2 Existing ED measures relevant to cancer care, current gaps, and measure development priorities

Cancer-specific ED measures
<i>Description:</i> Measure aspects of emergency care that are unique to cancer patients. Include measures of the processes, outcomes, structure, efficiency, and costs of care as well as patients' perception-of-care
<i>Rationale:</i> Cancer patients visit the ED throughout the continuum of care and often present with complex, interrelated symptom burden. Most ED measures focus on cardiovascular disease and are not relevant to oncologic emergency care. In addition, many cancer patients experience unique quality of care issues (e.g., late-stage cancers presenting to the ED) that reflect quality issues in other care settings. The existing measures are not sensitive to these issues. Widespread adoption of cancer-specific ED measures will help stimulate improvements in emergency oncologic care
<i>Current measures:</i> Two cancer-specific ED measures have been developed, and one measure is NQF-endorsed. They assess overutilization of ED services, due to poor symptom management, aggressive treatment, poor care coordination, or inadequate access to care
<i>Examples:</i>
– NQF measure #0211—Proportion with more than one emergency department visit in the last days of life
– Potentially Avoidable Admissions and Emergency Department Visits Among Patients Receiving Outpatient Chemotherapy, not endorsed by the NQF as of January 2015
<i>Health services research priorities: Listed below by measure type</i>
<i>Measure development priorities: Listed below by measure type</i>
ED outcome measures
<i>Description:</i> Measure the outcomes of emergency care, including the sustainability of health post-ED discharge, timeliness of ED care, and treatment complications during and after ED discharge
<i>Rationale:</i> Cancer patients frequently visit the ED for symptom management (e.g., management of acute pain and fatigue) due to cancer treatment or cancer progression. In addition, ED care delays are associated with ED overcrowding and boarding and, ultimately, poorer outcomes and compromised quality of life. Failure to measure the timeliness of care—in particular, timely symptom improvement—represents a failure to measure the most important outcomes for these patients
<i>Current measures:</i> There are only two NQF-endorsed ED outcome measures. These are “time to” ED measures, which evaluate ED throughput and the timeliness of care
<i>Examples:</i>
– NQF measure #0495—Median Time from ED Arrival to ED Departure for Admitted ED Patients
– NQF measure #0497—Admit Decision Time to ED Departure Time for Admitted Patients
<i>Health services research priorities:</i>
– Develop protocols to adopt validated patient-reported outcome surveys as a standard of care for EDs to collect data on symptom burden and quality of life in the ED and post-ED discharge. Focus on minimizing patient burden and leveraging telehealth and other emerging technologies, where possible
– Study clinical and patient characteristics that are associated with repeat ED visits and health decline post-ED discharge in the cancer population
<i>Measure development priorities:</i>
– “Time to” patient-reported symptom improvement in the ED, stratified by chief complaint
– “Time to” cancer diagnosis, for patients presenting to the ED with an undiagnosed cancer
– Sustainability of patient-reported symptom improvement post-ED discharge, stratified by chief complaint
– Repeat ED visits within 2, 7, and 14 days of ED discharge, stratified by chief complaint
– ED length of stay for cancer patients, stratified by: (1) patients admitted to an inpatient unit, (2) patients transferred to another facility, and (3) patients discharged home
ED process measures
<i>Description:</i> Assess compliance with established standards of ED care that have been linked to improved patient outcomes, reductions in unnecessary care, and more equitable care. Include a wide array of measures, such as adherence to: guideline-based diagnostic testing and treatment; protocols around patient intake, discharge, and care coordination; and policies to ensure equitable care for vulnerable patient populations
<i>Rationale:</i> Routine measurement of adherence to guideline-based care can highlight practice variations across providers that ultimately contribute to poorer outcomes or higher costs of care for some patients. In particular, measuring care coordination by ED providers is important to ensure that patients are guided to appropriate follow-up care and to prevent repeat ED visits and inpatient admissions
<i>Current measures:</i> There are twenty NQF-endorsed ED process measures. Eleven of these measures are disease-specific, including one cancer-specific ED measure; the remaining measures focus on care coordination across all conditions. Only one ED process measure evaluates care coordination for patients discharged to outpatient care
<i>Examples:</i>
– NQF measure #0092—Emergency Medicine: Aspirin at Arrival for Acute Myocardial Infarction (AMI)
– NQF measure #0291—Emergency Transfer Communication Measure
<i>Health services research priorities:</i>
– Develop algorithms to identify patients at potential risk of presenting to the ED with an undiagnosed cancer
– Test methods to promote care coordination between outpatient oncology and ED providers

(continued)

Table 2 (continued)

– Model episodes of oncologic emergency care, with well-defined endpoints and treatment pathways
– Develop algorithms to identify patients at risk for disparities in care that present to the ED
<i>Measure development priorities:</i>
– Screening and diagnosis for high-frequency complications that present to the ED (e.g., pain, fatigue, dyspnea, nausea, dehydration, depression, and cognitive impairment)
– Patients discharged with a referral to an appropriate outpatient oncology provider
– Advance care planning discussions for patients with advanced cancer
– Cancers diagnosed in the ED, stratified by: (1) cancer type and (2) stage of disease
ED cost-of-care measures
<i>Description:</i> Calculate direct and indirect costs for a specific medical condition, episode of care, or healthcare service. Demonstrate variations in costs across medical conditions, care delivery settings, and between providers
<i>Rationale:</i> Cost-of-care measures can increase transparency around cost inefficiencies (perceived and actual) as well as higher costs associated with adverse events, delayed diagnosis and treatment, and individual patient factors, such as comorbid conditions [170]. Furthermore, these measures can provide important insights into cost variation between providers and care delivery settings, among patients with similar diagnoses, and across the continuum of cancer care
<i>Current measures:</i> There are no NQF-endorsed ED cost-of-care measures
<i>Examples:</i> None
<i>Health services research priorities:</i>
– Model episodes of oncologic emergency care, with well-defined endpoints and treatment pathways
<i>Measure development priorities:</i>
– Costs of care per ED visit, stratified by chief complaint
– Cost of diagnosing asymptomatic or quasi-symptomatic cancers in the ED
– Costs of managing patient comorbidities in the ED
– Costs of care by adverse event
– Costs of ED care in the last 7, 14, and 30 days of life
ED efficiency measures
<i>Description:</i> Examine the relationship between inputs and outputs in emergency care; they compare resource use (and associated costs) with the level of health outcome achieved
<i>Rationale:</i> Significant resources are expended in managing the complex—and often interrelated—symptoms, comorbidities, and psychosocial needs of patients presenting to the ED, particularly cancer patients
<i>Current measures:</i> There is one NQF-endorsed ED efficiency measure that evaluates the overuse of advanced imaging; it is not applicable to cancer
<i>Examples:</i>
– NQF measure #0667—Inappropriate Pulmonary CT Imaging for Patients at Low Risk for Pulmonary Embolism
<i>Health services research priorities:</i>
– Understand the overuse, underuse, and misuse of ED resources in cancer patients; this is largely unstudied beyond the frequency of ED visits. Develop guidelines for appropriate ED resource utilization for cancer patients
– Evaluate the relationship between ED resource utilization and outcomes for cancer patients
– Study the relationship between resource utilization (in the ED and in the outpatient setting) and repeat ED visits for cancer patients. Develop protocols to reduce repeat ED visits for cancer patients, particularly at the end of life
<i>Measure development priorities:</i>
– Efficient utilization of advanced imaging studies for cancer patients
ED patients' perception-of-care measures
<i>Description:</i> Evaluate patients' satisfaction with the healthcare received
<i>Rationale:</i> While restoration of health is a priority among cancer patients, equally important is patient (and caregiver) experience with care throughout the cancer care continuum. This is particularly true for patients with advanced cancer whose treatment may be noncurative
<i>Current measures:</i> One ED patients' perception-of-care survey has been developed, but further validation is required
<i>Examples:</i>
– Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey
– Emergency Department Patient Experience of Care (EDPEC) Survey, not endorsed by the NQF as of January 2015
<i>Health services research priorities:</i>
– Strategies to address the psychosocial needs of cancer patients with advanced disease and their caregivers
– Potential modifications to the EDPEC survey to make it applicable to oncologic emergency care
<i>Measure development and research priorities:</i>
– Modified EDPEC survey (or new patient experience with ED care survey), applicable to oncologic emergency medicine
– Survey of caregiver experience with emergency care and overall caregiver burden

Source: This table is based on the authors' analysis of existing ED measures relevant to cancer care [156], current gaps, and measure development priorities as of January 2015

quality across the entire emergency care system. In some cases this has led to duplicative measures for different programs (e.g., NQF measure #0286—*Aspirin at Arrival*, which is essentially the same as NQF measure 0092 but has been adopted for the OQR program). While these examples are specific to AMI, they nonetheless have important implications for oncologic emergency care.

Challenges in Obtaining ED Quality of Care Data

Much has been published in recent years regarding the limitations of existing data sources to support robust, actionable quality measurement. Historically, quality measurement relied upon administrative claims data, which are relatively easy to access but are not designed for quality reporting. Accordingly, the accuracy, relevance, and completeness of these data are questionable. At best, they offer an incomplete view of healthcare quality, particularly for cancer patients. Federal agencies and EHR vendors have promoted EHRs as a viable alternative to address these data issues. However, EHRs were designed to support healthcare operations, rather than quality measurement, and early assessments of EHR-based quality reporting have produced disappointing results [157–159]. Hence, manual chart review and data entry remain a primary method of collecting data—or supplementing electronic data—for purposes of quality measurement. Manual chart review is resource-intensive and is rarely performed on a real-time basis. Therefore, reliance on manual chart review limits access to the data that are critical for timely, actionable, and meaningful ED quality measurement. Moreover, because ED physicians often lack an established and ongoing relationship with their patients, they often lack access to data on the outcomes of ED patients immediately post-discharge as well as longitudinal data to support robust quality measurement for these patients. Potential strategies to address these issues are described later in this chapter.

Desired State of National Quality Measurement for Oncologic Emergency Care

In reviewing the history and current state of national quality measurement for emergency medicine, several important themes emerge:

1. There is widespread acknowledgement of the essential role that EDs serve in the nation's public health system.
2. Quality issues in emergency medicine are well documented, and healthcare experts have developed practical recommendations to address many of these issues.
3. Some quality issues observed in the ED are unrelated to the quality of emergency care and, instead, reflect broader social issues (e.g., inadequate access to healthcare) or quality of care issues in other healthcare settings.

4. Public and private organizations have recognized that quality measurement is integral to ED quality improvement, and early successes in cardiovascular emergency medicine have demonstrated how ED-based national quality measurement can be leveraged to improve patient outcomes.
5. HIT advancements, together with increased adoption of EHRs, offer the potential to give ED providers greater access to the data needed to care for their patients and to evaluate their quality of care on a more real-time basis.

While not specific to oncologic emergency care, these accomplishments represent a solid platform on which to develop national reporting for oncologic emergency care. In general, public reporting for cancer care has experienced minimal progress in more than a decade and has lagged behind public reporting for other conditions, such as diabetes and cardiovascular disease. These findings apply to public reporting for oncologic emergency care as well. Five factors that contribute to this inertia were described earlier in this chapter: (1) gaps in existing ED measures, (2) fragmented measure development, (3) difficulty defining the episode of oncologic emergency care, (4) measurement without a clear mechanism for improving ED care, and (5) challenges in obtaining ED quality data. Many of these factors stem from substantial shortcomings in funding, oversight, and coordination of measure development and public reporting for cancer care.

In this section, we outline a vision for measuring quality in oncologic emergency care, through the implementation of the IOM's recommendation to create a comprehensive national quality reporting program for cancer care. This includes a well-coordinated approach to developing cancer-specific ED quality of care measures. We also propose healthcare policy changes that will promote better alignment between public reporting and reimbursement for oncologic emergency care and that will promote shared accountability across providers. Additionally, we describe how the IOM's recommendation to implement a learning healthcare system for cancer could address many of the challenges in obtaining ED quality of care data. Finally, we share initiatives at MD Anderson to measure and improve the quality of oncologic emergency care delivered in its ED.

Vision for National Quality Measurement in Oncologic Emergency Care

Since 1999, the IOM has promoted national quality measurement as an essential lever to improve the quality of US cancer care delivery. In 2013, the IOM released *Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis*, which outlined six components of a high-quality cancer care delivery system: (1) engaged patients, (2) an adequately staffed, trained, and coordinated workforce,

(3) evidence-based cancer care, (4) a learning healthcare information technology system, (5) translation of evidence into clinical practice, quality measurement, and performance improvement, and (6) accessible, affordable cancer care [75]. The report identified the nation's inability to systematically measure and improve cancer care delivery as a primary contributor to existing gaps in cancer quality and offered the following recommendation:

Recommendation 8: Quality Measurement

Goal: Develop a national quality reporting program for cancer care as part of a learning healthcare system.

To accomplish this, the Department of Health and Human Services should work with professional societies to:

- Create and implement a formal long-term strategy for publicly reporting quality measures for cancer care that leverages existing efforts.
- Prioritize, fund, and direct the development of meaningful quality measures for cancer care with a focus on outcome measures and with performance targets for use in publicly reporting the performance of institutions, practices, and individual clinicians.
- Implement a coordinated, transparent reporting infrastructure that meets the needs of all stakeholders, including patients, and is integrated into a learning healthcare system [75].

Implementation of this national quality reporting program for cancer care would enhance quality measurement across multiple care delivery settings, including the ED. It would support purposeful, well-coordinated, and patient-centered quality measurement in the ED, with an emphasis on care coordination and shared accountability across providers and care delivery settings. Through public reporting, it would encourage evidence-based care delivery and patient engagement, while discouraging unnecessary—and *potentially harmful*—care. By increasing transparency around the outcomes, processes, and costs of cancer care, the national reporting program envisioned in the report could expedite progress toward a high-quality cancer care delivery system, of which the ED is an essential component. Adequate funding, formal leadership, strong collaboration, and HIT enhancements, together with a well-developed framework and a unified strategy, are essential to its successful implementation, as discussed below.

Health Policy for Measuring Quality in Oncologic Emergency Care

As described earlier in this chapter, EMTALA and the no-duty-to-treat principle form the health policy base for emergency care in the USA. While EMTALA ensures patient access to emergency medical care, it does not regulate the quality of that care. More recently, the MMA, DRA, and Tax Relief and Health Care Act of 2006 introduced and

incentivized national quality reporting for emergency care. The quality reporting stimulated by this legislation did little to promote high-quality oncologic emergency care, because it focused largely on other conditions, such as cardiovascular disease.

To advance quality in the nation's oncologic emergency care, national quality reporting for cancer care is essential, as recommended by the IOM. The frequency, complexity, and costs of oncologic emergency care, particularly at the end of life, necessitate a well-coordinated and unified approach to address current measurement gaps in oncologic emergency care. Thus, we offer the following policy recommendations in support of this effort:

- *Leadership and Collaboration: Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis* identified HHS as the appropriate organizer of this work. Through collaboration with patient advocacy organizations, professional societies, payers, and other stakeholders, HHS could ignite national development of quality measures for oncologic emergency care. Designating CMS and the NQF as key partners in this effort could accelerate progress in developing validated cancer-specific ED quality of care measures.
- *Formal Long-Term Strategy:* Create and enforce a formal long-term strategy (with shorter-term milestones) and a well-defined framework for the development and public reporting of measures for oncologic emergency care (as part of a broader strategy and framework for cancer). This long-term strategy would address the needs of all cancer patients, with a particular focus on cancer patients seeking emergency care at the end of life. Moreover, it would promote shared accountability by providers, by moving away from quality measurement focused on specific Medicare payment programs.
- *Research:* Fund health services research and clinical trials to expand the scientific evidence for oncologic emergency care, including:
 - Effective care coordination between outpatient oncology and ED providers.
 - Outpatient care delivery models that reduce unnecessary ED utilization among cancer patients.
 - Approaches to mitigate the overutilization of ED services by cancer patients, particularly at the end of life.
 - Episodes of oncologic emergency care, with well-defined endpoints and treatment pathways.
 - Strategies to address the psychosocial needs of cancer patients with advanced disease and their caregivers.
 - Drivers of late-stage cancers presenting to the ED.
 - Care delivery models that integrate palliative care with ED services.
- *Measure Development:* Fund the development of a robust set of meaningful measures for oncologic emergency care (including performance targets) for use in public

reporting. Measure development should focus on the outcomes of care as well as access to care, care coordination, advance care planning, patient and family engagement, and evaluation and management of acute and chronic conditions and psychosocial needs. High-priority measurement gaps are described in Table 2 of this chapter. Prioritization of measure development should align with the formal long-term strategy guiding this effort and target likely healthcare disparities. Moreover, measure development should have a well-defined cost-benefit relationship and should foster shared accountability across providers and including patients. Where appropriate, the developed measures should address multiple care delivery settings. Measures available from existing data sources should receive higher priority. However, lack of data should not constitute a barrier to measure development. A formal tool should be developed to assist the collaborative in prioritizing measure development [160].

- *Transparent Reporting Infrastructure:* As recommended by the IOM, implement a reporting infrastructure (including IT infrastructure and reporting methodologies) that promotes transparency of the outcomes that are most meaningful to patients and their caregivers and that meets the information needs of all stakeholders (patients and their caregivers, providers, payers, and state and federal agencies). Public reporting should be understandable by patients and their caregivers to support healthcare decision-making.

Expedited adoption of health policy in support of these priorities would do much to address the existing measurement gaps for oncologic emergency care. With multi-stakeholder collaboration among organizations that share a vested interest in oncologic emergency medicine as well as proper funding and authority, robust national quality measurement for oncologic emergency care could become a reality within a few years.

HIT Support through the Learning Healthcare System for Cancer

Providers face significant obstacles in obtaining timely, actionable, and comprehensive data to support the robust quality measurement described herein. Additionally, because ED providers lack an established and ongoing relationship with their patients, they often do not have access to post-discharge and longitudinal outcomes data to support meaningful quality measurement. To advance meaningful quality measurement and public reporting, *Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis* advocated the creation of a learning healthcare system for cancer [75]. A learning healthcare system streamlines provider data collection and reporting and enables real-time data analysis for performance improvement, quality measurement,

and clinical decision support. The cancer-specific learning healthcare system described by the IOM would support more rapid innovation in cancer care delivery by addressing critical data gaps in two ways: (1) by capturing provider-driven clinical data, patient-reported outcomes, and patient and caregiver experience with care in a structured format and (2) by integrating structured, unstructured, and semi-structured data. National endorsement of this recommendation would address many of the data gaps described in this report and would enable development and reporting of quality measures for oncologic emergency care. To be successful, federal incentives to promote HIT adoption (e.g., Meaningful Use) should incorporate the principles of a learning healthcare system for cancer [161]. Likewise, public and private payers should reward providers for participating in a learning healthcare system for cancer. Aligning provider incentives with adoption of a learning healthcare system for cancer would enhance the current IT infrastructure and promote widespread access to the information needed to catalyze national public reporting for oncologic emergency care.

Role of Targeted Quality Measures in Driving Practice Change

As noted earlier in this chapter, quality measures provide a standardized, objective means of evaluating healthcare quality and hold an important role in the US healthcare delivery system, including emergency care. State and federal agencies utilize quality measures to promote provider accountability and to inform the public. Increasingly, payers are using quality measures in value-based payment programs to align reimbursement with quality of care. Because cancer patients experience unique quality of care issues and because most disease-specific ED measures focus on cardiovascular disease, the existing ED quality of care measures offer minimal opportunity to improve the quality of oncologic emergency care. Despite these limitations, *appropriately selected* quality measures have the potential to inform consumer decision-making and care planning, accelerate improvements in care, and highlight variation between providers and over time within a given practice setting [75]. Additionally, routine quality measurement and reporting enables payers and providers to test whether new care delivery and payment models have a positive effect on the accessibility, quality, and affordability of healthcare.

Public reporting of well-designed quality measures for oncologic emergency care represents a powerful policy lever to encourage more appropriate ED resource utilization, better care coordination, shared accountability, and, ultimately, superior outcomes and patient (and caregiver) experience with care. Lamb et al. observed that the act of measuring performance at the provider level can ignite an interest in self-improvement or a spirit of competition among providers,

leading to improvements in care [162]. Pay-for-performance programs are another promising policy lever, which could lead to improvements in the quality of oncologic emergency care. The effectiveness of pay-for-performance has been the subject of much debate, given current measurement gaps across multiple conditions and in various aspects of care. However, designing a pay-for-performance program around targeted quality measures for oncologic emergency care (such as those listed as measure development priorities in Table 2) could stimulate significant and lasting improvements in care.

Case Study: MD Anderson Experience

Background

Founded in 1941 and located in Houston, Texas, MD Anderson is one of the world's most respected centers devoted exclusively to cancer patient care, research, education, and prevention. The institution is one of the nation's original three comprehensive cancer centers designated by the National Cancer Act of 1971 and is one of 41 National Cancer Institute-designated comprehensive cancer centers as of January 2015 [90]. MD Anderson's mission is to eliminate cancer in Texas, the nation, and the world through outstanding programs that integrate patient care, research, and prevention and through education for undergraduate and graduate students, trainees, professionals, employees, and the public. Underlying MD Anderson's mission is a strong focus on delivering high-quality cancer care.

Between 1944 and 2014, nearly 1,000,000 patients turned to MD Anderson for cancer care in the form of targeted therapies, surgery, chemotherapy, radiation and proton therapy, immunotherapy, or combinations of these and other treatments. Additionally, more than 24,000 patients annually visit MD Anderson's 43-bed Emergency Center for acute oncologic emergencies associated with disease progression, treatment-related side effects, and comorbidities. Moreover, many individuals with confirmed or suspected cancer seek entry into MD Anderson through its dedicated ED. Thus, MD Anderson's ED represents an important safety net for patients in two ways: (1) by coordinating care across a number of disciplines for established patients with cancer-related emergencies and (2) by helping prospective patients navigate the oncology care system and directing them to appropriate follow-up care. MD Anderson's ED is strategically aligned within the institution to create, implement, monitor, and evaluate quality improvement efforts as part of the continuum of cancer care. This essential role highlights the importance of well-coordinated, high-quality care in MD Anderson's ED. In this section, we describe three structural elements that promote high-quality care in MD Anderson's ED: (1) culture of safety and quality, (2) availability of com-

prehensive services, and (3) oncologic emergency protocols.

Culture of Safety and Quality

Experiences from other industries, such as aviation and nuclear power, suggest that culture has an enormous impact on safety. Likewise, a strong safety culture has been proposed as a critical lever to reduce harm in the healthcare setting. Nevertheless, hospitalized patients continue to experience adverse events, with recent estimates suggesting that between 210,000 and 400,000 patients die from harm each year [163]. This suggests the need for a renewed focus on hospital safety culture to protect patients, their families, and healthcare staff.

The culture of safety and quality within MD Anderson's ED starts with a highly efficient team-based framework, with clearly defined and well-aligned expectations, open communication, shared accountability, and transparency. The ED's Quality Officer leads quality initiatives within the department and is a member of MD Anderson's Division of Internal Medicine Quality Council. Together, the ED and the Quality Council monitor patient care in the ED to ensure alignment with the IOM's six aims for quality care [164]. ED staff members meet monthly to review safety events and near misses reported via MD Anderson's event reporting system and to consider relevant peer-review cases. The team uses this information to identify opportunities for system-based improvement, in collaboration with staff from MD Anderson's Office of Performance and other internal stakeholders. ED faculty monitor progress on quality improvement initiatives through data collection and routine quality measurement. A dashboard is available for physicians to monitor their progress on high-priority metrics, including patient satisfaction with physician care, length of ED stay, patients returning within 48 h of ED discharge, and other productivity metrics.

Provider education is a cornerstone of the culture of safety and quality within MD Anderson's ED. ED leaders leverage internally developed educational materials to increase transparency around medical errors. For example, MD Anderson has developed a video series that highlights system-level issues that could lead to a medical error. The "stories" are based on near misses and promote interventions to improve patient safety [165]. ED staff routinely review and discuss these videos to direct attention to situations that could lead to patient harm. Additionally, ED physicians receive intensive training via MD Anderson's Faculty Leadership Academy and Clinical Safety and Effectiveness (CS&E) course. The CS&E course is an 8-day course, modeled after a program developed by Dr. Brent James at Intermountain Health Care in Utah [166]. It is designed to embed validated quality improvement techniques within frontline care delivery teams

and emphasizes routine quality measurement. During the course, ED providers are able to put these skills into practice by completing a quality improvement project in the ED. Continuing education in patient safety and cultural competency training also support the ED's culture of safety and quality.

Comprehensive Services Available

To ensure timely and effective care for patients with acute oncologic emergencies, MD Anderson's ED offers a comprehensive array of services. Patients have access to standard emergency services, including diagnostic imaging, internal medicine consults, and chaplaincy. Specialty consults are readily available, including neurosurgery, interventional radiology, and palliative care. Clinical pharmacists are also on staff to help prevent adverse drug events. This comprehensive and multidisciplinary approach enables MD Anderson's ED to address acute oncologic emergencies for established patients in an effective and efficient manner. Furthermore, it allows many ED patients to be discharged to home, avoiding unnecessary hospitalizations.

Five percent of patients visiting MD Anderson's ED are not established patients. In some cases, these patients do not present with a true oncologic emergency but are attempting to gain access to MD Anderson. Patients suspected of having cancer—based on clinical or radiographic findings—receive a full evaluation, and a patient advocate orients them to MD Anderson. Stable patients are referred to MD Anderson's Suspicion of Cancer Clinic and are typically seen within three business days. Thus, as noted previously, MD Anderson's ED serves as a gateway into MD Anderson's care delivery system for prospective patients. More importantly, it functions as a safety net by directing patients with a confirmed or suspected cancer diagnosis to appropriate follow-up care.

Oncologic Emergency Protocols

Because of the large number of patients that visit MD Anderson's ED each year, its providers are uniquely positioned to observe quality and patient safety issues for patients with acute oncologic emergencies. Thus, MD Anderson's ED has initiated numerous quality improvement initiatives, with some having a short duration and others requiring years to develop and implement. Some quality improvement initiatives have focused on operational efficiency, including reducing ED length of stay through a physician-nurse triage team and reducing boarding by creating an observation unit in the ED. Other initiatives have targeted end-of-life care and pain management. This experience has enabled MD Anderson's ED to develop, validate, and implement evidence-based approaches to improve the outcomes of patients that visit MD Anderson's ED. Three examples are described below: (1) pneumonia pathway, (2) early goal-

directed therapy for patients with sepsis, and (3) spinal cord compression management.

Pneumonia Pathway

Pneumonia is a common complication of cancer treatment. In 2005, a multidisciplinary team with representation from the ED, infection control, pulmonary medicine, respiratory therapy, nursing, and pharmacy was formed to evaluate the process of care for cancer patients presenting to the ED with pneumonia. The team conducted a four-phase quality study that included a baseline practice evaluation, an extensive literature review, and an analysis of the pathogens responsible for community-acquired pneumonia. They concluded that MD Anderson patients experienced healthcare-associated pneumonia more frequently than community-acquired pneumonia and developed an institutional pneumonia algorithm and order set to establish best practices for evaluation and management of pneumonia in cancer patients. An intensive hospital-wide educational program was launched, which led to significant utilization of the institutional pneumonia order set and reduced variation in care. Because treatment of cancer patients with pneumonia falls outside established guidelines for treating community-acquired pneumonia, adherence to the internally developed pneumonia pathway is essential [167]. MD Anderson continues to monitor adherence to the pneumonia pathway to optimize outcomes in patients with healthcare-associated pneumonia.

Early Goal-Directed Therapy for Patients with Sepsis

The development of sepsis in cancer patients can be life-threatening. However, recognizing sepsis in cancer patients can be challenging, due to altered inflammatory responses. Early goal-directed therapy (EGDT) has been recommended as an effective means of managing severe sepsis and septic shock in cancer patients, through aggressive surveillance and management of hemodynamics. Therefore, in 2010, MD Anderson's ED implemented a noninvasive sepsis EGDT protocol to assess its impact on patient outcomes. A multidisciplinary team of ED physicians, nurses, respiratory therapists, and pharmacists designed an algorithm focused on early identification at triage, timely clinical management, and rapid antibiotic administration and hemodynamic management. A sepsis documentation tool was created to support timely documentation of vital signs as well as communication with the treating physician. Hanzelka et al. associated adoption of MD Anderson's sepsis order set and algorithm with a significant improvement in interim outcomes, such as mean arterial pressure and urine output, and a decreased 28-day in-hospital mortality rate [168]. Through provider education and routine quality measurement, MD Anderson's ED encourages compliance with the noninvasive sepsis EGDT protocol. Implementation of this protocol improves the timeliness and efficacy of care for patients

with severe sepsis or septic shock and, most importantly, saves patient lives.

Spinal Cord Compression Management

Spinal cord compression in cancer patients can greatly diminish quality of life, leading to severe pain, paralysis, and sensory loss [169]. To ensure timely diagnosis and treatment of spinal cord compression, MD Anderson's ED began development of a spinal cord compression management protocol in 2012. A multidisciplinary team, with ED physicians and representation from neuro-oncology, neuroradiology, radiation therapy, and neurosurgery, evaluated best practices of care for patients presenting with back pain, metastatic spine disease, and suspicion of spinal cord compression. A comprehensive algorithm and order set were developed and adopted by MD Anderson [169], as described in more detail in Chapter 13 of this book. Adoption of this protocol as a best practice has led to an increase in palliative care consults for patients with spinal cord compression associated with metastatic disease. Moreover, it has allowed MD Anderson's emergency care team to quickly recognize and treat spinal cord compression, leading to improved symptom control and function preservation.

Conclusion

In this chapter, we examined the history, current state, and desired future state of health policy for quality in oncologic emergency care. We discussed five quality issues that cancer patients experience when seeking care in the ED, together with upstream drivers. We also described specific issues for dedicated oncology EDs. We highlighted the essential role of quality measures in addressing these quality of care issues, along with five limitations of the existing quality measures that apply to emergency care. We also shared the quality measures for emergency care that are currently endorsed by the NQF and used in CMS quality reporting programs. We outlined recommendations for national quality measurement for oncologic emergency care, through the implementation of the IOM's recommendation to create national quality reporting for cancer care, as part of a learning healthcare system. We proposed health policy changes—in the form of leadership and collaboration, formal long-term strategy, research, measure development, and transparent reporting infrastructure—to accelerate progress toward national quality measurement for oncologic emergency care. We emphasized the importance of adequate funding, formal leadership, strong collaboration, and HIT enhancements to make this reporting a reality. We also explained how a learning healthcare system for cancer and targeted quality measures can catalyze change and advance progress toward the national reporting program described herein. Finally, we shared MD

Anderson's efforts to promote high-quality care within its Emergency Center through a culture of safety and quality, by offering comprehensive services to its patients, and through implementation of oncologic emergency protocols.

The recommendations outlined in this chapter are ambitious, but are necessary to accelerate the development of targeted quality measures for oncologic emergency medicine. To be successful, measure developers and other stakeholders must abandon the historical practice of siloed development of highly specific measures that apply to a small proportion of the population or to a single care delivery setting. With adequate funding, unified leadership, and multi-stakeholder commitment, national quality reporting for oncologic emergency medicine could become a reality within a few years, leading to more patient-centered and higher-quality cancer care in the ED.

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