An Inflection Point in the Evolution of Oncologic Emergency Medicine

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INTRODUCTION

In what has become a near-weekly ritual, one of us (K.H.T.) receives an emotionally laden call about the plight of a loved one, colleague, or acquaintance with cancer who needs our help to navigate the labyrinth of emergency care. The patient may receive care at our comprehensive cancer center but become "stranded" in an emergency department (ED) outside the often rigid borders between our center and other health care systems. They may be only a few blocks away, or in another town, state, or country. Usually, after a flurry of calls or e-mails, the patient is accepted into one of our clinics. At times, the patient must sign out against medical advice to come directly to our ED. These exercises often end with the caller's tremendous expressions of gratitude, thanking us for being "miracle workers." However, it shouldn't take a miracle to communicate and deliver high-quality patient-centered care in the ED.

Every year, between 1 and 3 million US ED visits are related to cancer.[1] The visits may be the index presentation leading to an eventual cancer diagnosis. More commonly, such visits are prompted by symptoms resulting from cancer progression, treatment toxicities, or complications of surgery. These visits weigh heavy on our patients and often portend a worsening prognosis.

Because cancer is commonly a disease of aging, US EDs should expect to see increasing numbers of cancer patients and survivors as the population ages. Given projected shortages of cancer care providers, it is increasingly important for the emergency care community to better understand and expertly manage cancer emergencies. To fulfill the Triple Aim (improved patient experience, improved population health, and reduced health care costs) and effectively manage limited resources, we must foster transparent communication and collaboration between emergency physicians and the multiple professionals who participate in cancer care and research.[2] It is vital that emergency medicine nurture the next generation of oncologic emergency medicine clinicians, educators, and researchers to meet our patients' needs.

NATIONAL CANCER INSTITUTE/OFFICE OF EMERGENCY CARE RESEARCH WORKSHOP

We applaud Brown et al,[3] who summarize in this issue of *Annals* the National Cancer Institute and Office of Emergency Care Research for their effort to develop an agenda and establish an infrastructure to support oncologic emergency care research. The 1-day National Cancer Institute/Office of Emergency Care Research workshop discussed data needs and targeted specific emergency care topics for study, including neutropenic fever, sepsis, symptom management, and spinal cord compression. Much of the day focused on unmet palliative care needs, an area in which our specialty is primed to make major advances. Rest assured these topics serve only as a starting point.

Although the National Cancer Institute/Office of Emergency Care Research initiative suffers from the usual lack of dedicated federal funding for emergency care research, it is a great first step. We look forward to the continued growth of the Comprehensive Oncologic Emergencies Research Network (CONCERN) consortium and particularly to individual and sustained independent research careers' emerging from the network.

BEYOND CONCERN

Oncologic emergency medicine focuses on the discovery and application of time-critical diagnostics, decisionmaking, and treatments to save lives, reduce disability, and restore health among persons with cancer.

Traditionally, emergency medicine training has focused on a limited number of clinical oncologic emergencies and their varied presentations. As oncologic emergency medicine matures, our specialty has the opportunity to address cancer care more broadly and systematically, ideally within a population-based, comprehensive cancer care

system. Through such efforts, we can recapitulate past successes in systems-based trauma, cardiac, and stroke care, all of which save lives.

To establish oncologic emergency medicine as a more comprehensive force, we must better understand the systems and contextual issues surrounding cancer care. Our goals are more likely to be realized if we pursue broadly based long-term strategies, developing a playbook (macro level) based on the priorities we have discussed that is readily adaptable (similar to calling an audible) to the individual patient or provider (micro level).

EDs have important roles to play throughout the natural history of cancer, involving primary prevention and secondary screening efforts, as well as acute and palliative care. As always, we must also address economic drivers of cancer care while adhering to the Triple Aim to help create and sustain our research programs (Figure).

Prevention

Consider our role in primary and secondary cancer prevention. Emergency medicine investigators have studied exposure to several potential cancer risk factors, including tobacco,[4] obesity,[5] alcohol,[6] air pollution,[7] and human papilloma virus.[8] More than 2 decades ago, we conducted the National Emergency X-Radiography Utilization Study to better define the role of cervical spine radiography in blunt trauma. Indeed, one of the supporting rationales for the study was to prevent iatrogenic thyroid cancers.[9] At the specialty level, emergency medicine initiatives continue to target excessive exposure to cancer-causing ionizing radiation.[10]

In regard to secondary prevention, early emergency medicine cancer-related literature highlighted the poor prognosis for cancer diagnoses made in the ED, terming the phenomenon "a failure of primary care."[11] Given poor access to screening services among patients we serve, a number of investigators have examined the role of emergency medicine in breast, cervical, and colorectal cancer screening.[12,13]

Acute Care

In addition to our traditional focus on acute treatment of cancer emergencies, we should enumerate and examine cancer-related ED visits for opportunities to improve upstream cancer care. Although not all ED visits are avoidable, many result from toxicities of anticancer treatments and complications of surgery that can be prevented. Regional variations in chemotherapy-related ED visits can vary as much as 4-fold, suggesting a particularly promising target for quality improvement and cost reduction.[14,15]

A larger number of ED visits can likely be prevented by the development of oncology-specific, patient-centered medical homes. To aid transitions of care, the medical home model can complement improved discharge planning and patient-centered communication about expectations during the immediate posthospital window. At least 1 patient-centered medical home reported a 68% decrease in

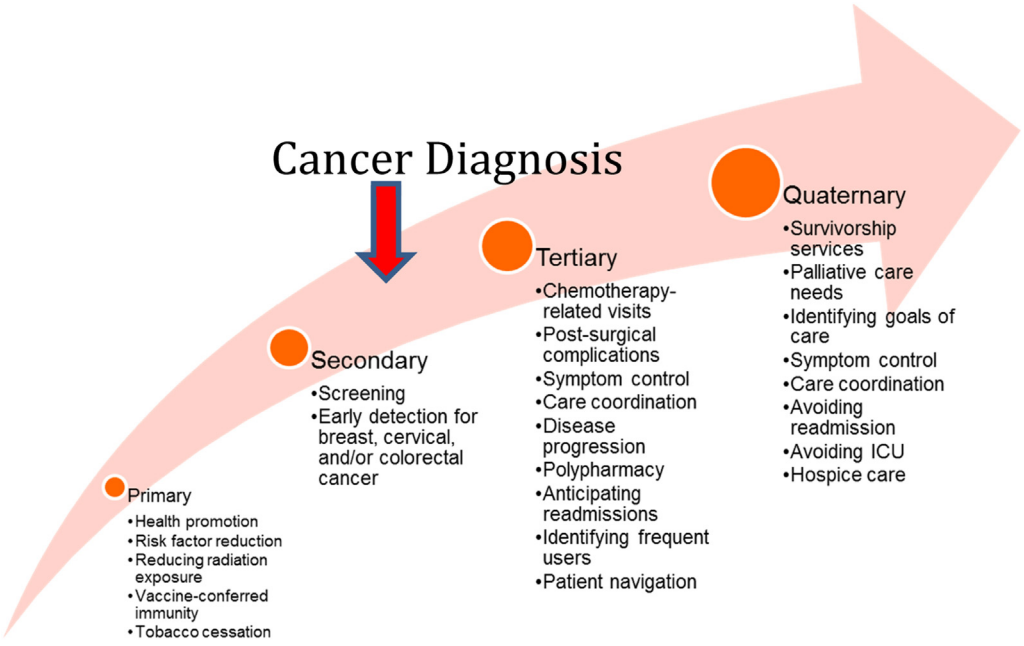

Figure. The scope of oncologic emergency medicine.

ED visits among its patients, achieved through a coordinated strategy of expanding clinic access, standardizing patient assessment and patient empowerment, and using oncology-specific electronic health records and telephone triage systems.[16]

We should work with our oncology partners to define additional quality measures for oncologic emergency medicine and systematically assess ED events that can serve as patient-oriented metrics of cancer care quality.

Palliative Care

Critical decisions made in the ED often determine the trajectory and intensity of treatment for individuals with cancer. To the extent that these inflection points address our patients' stages of disease and goals of care, ED cancer care can and will improve. The number of emergency medicine palliative care leaders has now reached a critical mass, and our specialty represents a strategically important force to improve the quality of end-of-life care.[17] Hospice and palliative medicine is now a recognized subspecialty of emergency medicine, and 2 national efforts, the Improving Palliative Care in Emergency Medicine initiative from the Center to Advance Palliative Care and the Education in Palliative and End-of-life Care for Emergency Medicine, specifically address emergency medicine's palliative care role. Incorporating palliative care principles into ED care should be among the earliest goals of nascent oncologic emergency medicine programs.[18,19] Recent clinical trials by ED investigators serve as a beacon on how to meaningfully influence cancer patients requiring emergency care services.[20,21]

SUSTAINABILITY

To state that funding opportunities for oncologic emergency medicine research are promising is a gross understatement. Examine the funding climate. Although the National Heart, Lung, and Blood Institute and National Institute of Neurologic Disorders and Stroke have been major federal funders of past emergency care research, the current budget for the National Cancer Institute is larger than that of both organizations combined.[22] Although categorizing federal research funding may be more art than science, the National Institutes of Health Research, Condition, and Disease Categorizations tool provides additional insight. For fiscal year 2017, cancer is estimated to receive $6.3 billion in funding (ranking 4 of 265 categories), whereas emergency care will receive $128 million (ranking 128), approximately the same amount as inflammatory bowel disease (ranking 127) and cannabinoid research (ranking 132).[23] These funding levels will likely increase after President Obama's announcement of the National Cancer Moonshot, a $1 billion federal initiative, in his 2016 State of the Union address.[24]

Beyond federal funding, consider that 260 US nonprofit organizations (combined budgets $2.2 billion) target cancer, exceeding the number of foundations devoted to heart disease, AIDS, Alzheimer's disease, and stroke combined.[25]

Given that cancer funding dwarfs that for emergency care, our specialty would be well advised to partner with the cancer community and harness even a small portion of their funding to train our clinician-scientists. Many departments of emergency medicine thrive within academic institutions that include one of the 41 National Cancer Institute–designated comprehensive cancer centers. One of the core research programs required of these centers is cancer prevention and control. This presents an opportunity for oncologic emergency medicine–driven research components to become strategically aligned within these programs. Furthermore, these centers offer a wide variety of training programs, including Institutional National Research Service Awards (T32 grants), which provide junior academic emergency physicians the formal research training that is fundamental to academic success. Enhancing emergency medicine collaboration with well-established mentors within National Cancer Institute–designated centers will promote more successful applications for Mentored Clinical Scientist (K08) and Patient-Oriented (K23) Research Career Development Awards. Given the large number of barriers to productive emergency medicine research careers, such a window of access to experienced mentors and research infrastructure will provide highly motivated junior faculty welcome opportunities to hone their research skills and develop more precisely defined academic careers. This well-trained cadre of emergency medicine investigators can contribute enormously to the design and execution of prospective diagnostic and therapeutic clinical trials, database analytics, nomogram outcome predictive tools, and more.

In 2010, the University of Texas MD Anderson Cancer Center established the first academic department of emergency medicine within a comprehensive cancer center. Within 5 years, the department grew from a small core group of faculty to include more than 60 physicians, researchers, and staff, a vibrant research program, and annual revenues of more than $20 million. The cancer hospital includes a 54-bed ED with an annual volume of 26,000 cancer-related visits (half of all cancer-related ED visits in metropolitan Houston). The department also established (in collaboration with the Baylor College of Medicine Emergency Medicine Program) the Oncologic

Emergency Medicine Resident Rotation, as well as the Oncologic Emergency Medicine Fellowship Program, now in its fifth year.[26]

Other academic EDs are cementing relationships with National Cancer Institute–designated cancer centers to increase their oncologic emergency medicine expertise. Notably, the Ohio State Department of Emergency Medicine recently collaborated with the Arthur G. James Cancer Hospital to open the first fully integrated 15-bed cancer treatment center within its general ED.[27] It is also heartening that the Department of Emergency Medicine of Brigham and Women's Hospital recently began recruiting academic emergency physicians to pursue oncology research in emergency care. As the primary ED affiliated with Dana Farber Cancer Institute, their collaboration has great promise to promote scholarship and develop academic leaders in oncologic emergency medicine.[28]

Such a trajectory of growth is encouraging, and for young emergency physicians considering academic careers, oncologic emergency medicine represents a terrific opportunity. Our fledgling field needs their skills, energy, and vision.

NEXT STEPS

To foster a field with such growth potential, organized emergency medicine should invest now. We urge philanthropic entities associated with emergency medicine, including the Emergency Medicine Foundation, to establish targeted funding for oncologic emergency medicine research. There is no better measure of a specialty's commitment to an emerging field than the decision to invest in itself. Where self-directed emergency medicine philanthropists lead, others will follow.

Every emergency medicine training program should identify at least 1 faculty champion to head oncologic emergency medicine education and research initiatives. These faculty members should be prepared to foster communications and collaboration with their cancer center partners.

All academic oncologic emergency medicine programs should conduct annual research retreats that involve colleagues from the cancer center leadership and especially from their cancer prevention and control research programs.

To identify and nurture areas of interspecialty fertilization, multispecialty annual symposia patterned after successful existing annual national cancer symposia should be established. Ideally, these would be cosponsored by emergency medicine (eg, the American College of Emergency Physicians, the Society for Academic Emergency Medicine) and nonemergency medicine specialty associations (eg, American Society of Clinical Oncology, American Society for Therapeutic Radiology and Oncology, American Academy of Hospice and Palliative Medicine, Society of Surgical Oncology).[29,30]

Model oncologic emergency medicine curricula should emerge beyond the typical "neutropenic fever, tumor lysis, and superior vena cava syndrome" topics. One resource for these expanded curricula is the new reference textbook *Oncologic Emergency Medicine: Principles and Practice*.[31]

In partnership with our cancer center colleagues, we should develop standard approaches to the management of ED presentations related to cancer progression or treatment. By exploiting the intrinsic existence of interdisciplinary commitment to quality patient-centered care, there will be no need for emergency medicine investigators to lose their unique identity or for oncologists to lose control of their patients who require ED care. From a quality improvement perspective, emergency medicine should be front and center in developing benchmarks for cancer care quality and comparative effectiveness metric analyses, including acceptable rates of chemotherapy-related ED visits and incorporation of cancer stage and patient goals of care in making end-of-life decisions.

Indeed, emergency medicine has a tremendous responsibility to our patients with cancer. It shouldn't take a miracle to receive emergency cancer care within the comprehensive cancer system our patients deserve. It does take hard work, and our specialty is up to the challenge.

We look forward to major advancements in oncologic emergency medicine as we also look forward to the next call from a colleague or acquaintance that doesn't come because emergency medicine has fostered more order and less chaos in cancer care.

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