

# Has the Emperor Met His Match?

In the 2015 Ken Burns documentary, *Cancer: The Emperor of All Maladies*, based on Siddhartha Mukherjee's *The Emperor of All Maladies*, the 2011 nonfiction award-winning biography about cancer, we are introduced to the first pediatric patient who received an experimental cellular therapy at Children's Hospital of Philadelphia (Penn Medicine News, 2015). The outcomes for that patient, initially treated in 2012 and now almost seven years into survivorship, led to the development of clinical trials with commercially developed chimeric antigen receptor (CAR) T-cell products.

In 2017, tisagenlecleucel (Kymriah®) became the first CAR T-cell therapy approved by the U.S. Food and Drug Administration ([FDA], 2017a), quickly followed by axicabtagene ciloleucel (Yescarta®) (FDA, 2017b). These approvals were the hallmark of what is described as a living drug, the use of genetically modified T cells to treat cancer (Fesnak, June, & Levine, 2016). In the continuing context of expanding indications and anticipated new agents in this drug class, oncology nurses and the care they provide are pivotal in the rapid and exciting expansion of cancer treatment. From the ongoing development of clinical trials to the first cohort of authorized centers for CAR T-cell administration, oncology nurses are making significant contributions to the clinical and operational management, as well as the science.

This supplement to the *Clinical Journal of Oncology Nursing (CJON)* features trailblazing work by oncology nurses and their interprofessional colleagues from across the country. They represent many of the institutions that are leading clinical trials, have developed guidelines for practice,

and have established CAR T-cell delivery programs. This supplement builds on foundational work, presented in the April 2017 *CJON* immunotherapy supplement (<https://bit.ly/2nDj1wF>), during a time when CAR T-cell therapies were not yet approved by the FDA.

In the short window since FDA approval in 2017, a growing body of clinical experience now exists from the 160 programs authorized, as of February 2019, to

nation between referring and treating centers, highlighted in Beaupierre et al. (2019). This article emphasizes the importance of nurses practicing not only in oncology settings, but also in the community and those providing critical emergency care. Ultimately, nurses from a variety of practice areas and specialties will provide evidence-based CAR T-cell therapy care and management across the treatment trajectory and into survivorship.

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"Nurses from a variety of practice areas will provide evidence-based CAR T-cell therapy care."

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administer one or both therapies. During this period of rapid growth and discovery, we now better understand the pathophysiology of CAR T-cell therapy and its implications for treatment, as presented in Lamprecht and Dansereau (2019) in this supplement. With the advent of this new treatment, standards are evolving to manage unique and potentially severe toxicities, as presented in Anderson and Latchford (2019). As featured in Taylor, Rodriguez, Reese, and Anderson (2019), the first authorized CAR T-cell therapy programs are guiding the growth of programs across the United States and beyond, providing a template for infrastructure similar to but distinct from existing hematopoietic stem cell transplantation programs.

As a result of still-limited program availability across the country, patients may need to seek treatment beyond their primary oncology care setting. This reality underscores the criticality of care coordi-

In addition, with survivors of the first clinical trials still within 10 years of their initial treatment, a foundation for practice has formed around the physiologic and psychosocial status and needs of pediatric and adult CAR T-cell therapy survivors. Of particular concern are late treatment effects, psychosocial implications, and the impact of financial toxicities. For pediatric and adult survivors, these pertinent issues are covered in Callahan et al. (2019) and Buitrago, Adkins, Hawkins, Iyamu, and van Oort (2019), respectively.

While the science of CAR T-cell therapy and its FDA-approved agents and indications evolve, oncology nurses remain instrumental in the care of these patients. That care encompasses the conduct of clinical trials, safe delivery of treatment, evidence-based monitoring, care coordination, and survivorship. Robust opportunities for nurse-led research and scholarship abound, focusing on the experience of patients undergoing this therapy, as

well as longitudinal studies of their physiologic and psychosocial sequelae after treatment. For the several hundred patients who have received on-study and standard-of-care therapy to date, and for all those populations for whom CAR T-cell therapy may yet be effective, the contributions of oncology nurses are pivotal to the advancement of this promising category of therapy.

Similar to how *The Emperor of All Maladies: A Biography of Cancer* (Mukherjee, 2011) traced the history of cancer care as we know it, so too will future biographies of cancer look back on this time of rapid treatment development and credit oncology nurse contributions to the science and delivery of care and to the evolving context of cellular therapies and their efficacy. Based on the expert and generous collaboration of its many authors, this supplement provides a timely, comprehensive resource about best clinical practices to deliver CAR T-cell therapy care.

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## KEYWORDS

CAR T-cell; immunotherapy; interprofessional; survivorship; treatment decision making

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