Review Article on Oncology Nursing

Growth and development of oncology nursing in North America

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Abstract: The specialty of oncology nursing has been evolving in North America for nearly a century, keeping pace with the rapid and dynamic developments in cancer care. This narrative review outlines the history and development of oncology nursing in North America with a focus on the United States and Canada. The review highlights the important contributions that specialized oncology nurses have made to the care of people affected by cancer from time of diagnosis through treatment, follow-up and survivorship care, as well as palliative, end-of-life, and bereavement care. Keeping pace with the rapid evolution of cancer treatments throughout the last century, nursing roles have similarly evolved to meet the need for more specialized training and education. This paper discusses the growth of nursing roles, including advanced practice and navigator roles. In addition, the paper outlines the development of professional oncology nursing organizations and societies that have been established to help guide the profession with best practices, standards, and competencies. Finally, the paper discusses new challenges and opportunities regarding the access, availability, and delivery of cancer care that will shape future development of the specialty. Oncology nurses will continue to be integral to the provision of high-quality, comprehensive cancer care as clinicians, educators, researchers, and leaders.

Keywords: Oncology nursing; cancer care; advanced practice nursing; navigation

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Introduction

Background

In his book, *The Emperor of All Maladies. A Biography of Cancer*, Siddhartha Mukherjee explains how "cancer is built into our genomes" (1) and thus, it would seem that cancer is a problem that comes with being alive. The history of cancer dates back to at least 3000 B.C. and to this day, remains a major cause of morbidity and mortality worldwide (2). Recent estimates provided by the Canadian and American Cancer Societies suggest that more than 40% of people will be diagnosed with cancer in their lifetime (3,4). Nurses have been and will continue to be involved in the prevention, detection, and management of cancer. While there is some foundational knowledge that is ubiquitous in nursing, the complexity of cancer and its treatment necessitates unique and expert knowledge and skills.

Objectives

The purpose of this paper is to provide a narrative review of the historical development of oncology nursing in North

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America, specifically in the United States and Canada. A scoping review of the literature and review of current guidelines, educational requirements, and certifications from professional and governmental organizations were used to highlight the current standards of clinical practice in oncology nursing and cancer care delivery as well as the emergence of new trends and opportunities. Given the rapid evolution of cancer diagnostics and treatments, the occurence of a new global pandemic, and the advances in technology, this paper will also explore challenges and opportunities regarding the access, availability and delivery of cancer care that will shape the future development of the specialty of oncology nursing.

History of oncology nursing in the United States and Canada

Oncology nursing has been growing as a specialty in North America for more than 90 years, experiencing similar and parallel development in the United States and Canada. As early as 1930, nurses were describing specialty care for people with cancer (5,6). In the 1940s, training of oncology nurses was first introduced as a specialty in United States with programs developed specifically for oncology nurses (7). The first university course in cancer nursing was offered at Columbia University in New York City in 1947 (8). Over the next 70 years, nurses caring for people with cancer changed from a focus on late stage of diagnosis and end-of-life care to incorporating new cancer screening tests, curative treatments, symptom management and survivorship care. Postgraduate education programs were established in academic institutions. The formal development of evidence-based guidelines, protocols for safe handling and administration of cancer treatments, and specific nursing roles in cancer care in North America continue to evolve to the present day (7,9,10).

Cancer treatments evolved quickly in the twentieth century. While surgery has long been a mainstay of cancer treatment, radiation was accepted as a cancer treatment for certain types of cancer beginning in the 1920s (11). Drugs to treat cancer, developed in clinical trials, expanded rapidly between 1960s to 1980s with new drugs, combination therapies, and new types of delivery including intravenous, intrathecal, and intracavitary treatments (12). As treatment regimens became more complex, oncology nurses needed to specialize in roles such as clinical trials nurse, chemotherapy nurse, and radiation nurse. Oncology nurses in cancer care were moving from task-oriented roles to being integral members of the interprofessional, multidisciplinary team (10). In addition, nurses were no longer just engaged with the delivery of cancer treatments, they became providers of cancer supportive care and symptom management, community educators on prevention and risk reduction, navigators across the cancer continuum, and providers of care after treatment during cancer survivorship and end-of-life care. Their leadership in clinical care of individuals with cancer has been instrumental in advancing research in symptom management and accelerating patient education and participation in care decisions (13).

In the 1980s, cytotoxic drugs were included in more cancer treatment plans, raising concerns that some cancer treatments may pose health risks to the health care providers involved in compounding and delivering treatments (14). Over 25 antineoplastic drugs currently used in cancer treatment are defined as human carcinogens (Group 1) or probable human carcinogens (Group 2A) by the World Health Organization's International Agency for Cancer on Research (15). Researchers discovered that health problems such as infertility were more common in nurses and pharmacists who had occupational exposure to the cytotoxic drugs (16). Since oncology nurses may have the potential for long-term, low-dose exposure to multiple hazardous drugs, professional organizations and government organizations developed guidelines for safe handling of these agents (17,18). In addition, the administration of radiation sometimes left nurses in contact with radioactive substances such as radium and radon (9). Guidelines and recommendations for safe handling, administration and disposal of chemotherapy and immunotherapy treatments have been published by the Oncology Nursing Society (ONS) (19).

Training and certification—career pathways

With the growing need for oncology nurses to have specialty training beyond basic nursing education, new programs for training, certification and career development emerged in North America. Certification for specialty roles in cancer nursing is available in both the United States and Canada. The Oncology Nursing Certification Corporation (ONCC) was founded in 1975 in the United States and became an independent affiliate of ONS in 1984 (20). ONCC provides five certifications for oncology nurses and advanced practice nurses (APNs). ONS also offers a certificate course and provider card to prepare nurses to safely administer chemotherapy and immunotherapy and use evidence to manage treatment related acute side effects and adverse events (21).

In Canada, nurses obtain oncology nursing certification through the Canadian Nurses Association (22). The first oncology nursing certification examination was offered in September 1997 (23), having been developed in collaboration with Canadian Association of Nurses in Oncology/Association canadienne des infirmières en oncologie (CANO/ACIO). In 2019, CANO/ACIO published the *Nursing Knowledge and Practice Framework for Cancer Care* (24,25). The document outlines the foundational cancer nursing knowledge required of all nurses, irrespective of practice setting or specialty area of practice, who care for people with cancer throughout the illness trajectory (24). In addition to describing the knowledge and skill specialty nurses in oncology require, the document responds to the growing incidence of cancer and the necessity for nurses in other specialties to possess basic knowledge and skill concerning cancer care.

Although certification in oncology nursing is not mandatory in either the United States or Canada, accreditation standards for cancer care facilities emphasize the importance of having well qualified nursing staff. Many comprehensive cancer programs indicate having a certification in oncology nursing is preferred for nurses to be hired into their settings (26).

Evolution of nurse navigators and APN

The roles and specialization of oncology nurses have evolved in response to the increasing complexity of cancer care and associated patient and family needs. Given the many settings and increased multidisciplinary nature of cancer care, patient navigation has made a difference for people with cancer since its introduction in 1990 (27). Navigation was initially developed to address barriers to the diagnosis and treatment of cancer and other chronic illnesses, particularly in marginalized populations (28). In cancer care, both clinical and nonclinical (peer or lay) patient navigators have been used to improve access to screening, decrease time from diagnosis to treatment, and improve the detection of cancer at earlier and more treatable stages (29,30). Nurses commonly hold the clinical navigator roles and guide patients from screening and diagnosis and competencies for novice nurse navigators have been developed (29,30). With their knowledge of community resources and understanding of social determinants of health, navigators can improve access to cancer screening, treatment, and related services (28).

APNs, such as nurse practitioners (NPs) and clinical nurse specialists (CNSs), have increasingly been included in the cancer care team (31). Given the increasing complexity of cancer treatment, APNs provide a range of services including coordination of patient care and assisting patients after a cancer diagnosis, during treatment, and into survivorship (32). While there is some overlap between NP and CNS roles, the roles are distinct. CNSs may be involved in program development, strategic growth initiatives, research, and education in addition to providing clinical care (32). In contrast, NPs are often clinic or practice-based as the focus of their role, although they may also be involved in various educational, research, and leadership activities (32). The APN scope of practice varies by jurisdiction and may include: ordering and interpretation of laboratory and radiologic tests, provision of advanced cancer treatment such as intrathecal chemotherapy, procedures such as bone marrow biopsies, seeing new consults, symptom and adverse event management, evaluation of patients prior to treatment, provision of survivorship care and palliative care, involvement in hospital rounds, and prescription management (32).

In a 2016 survey by the American Society of Clinical Oncology, a shortage of physicians in oncology was predicted to impact the US and the number of advanced practice providers (APPs) (NPs and physicians assistants) was estimated to address gaps in care (33,34). A subsequent meeting of the *National Academies* National Cancer Policy Forum resulted in recommendations for including APPs in the oncology workforce to address the needs of people with cancer (35). The future is pointing towards an increased need for oncology nurse practitioners (ONPs) to meet the needs of patients through a model of collaboration, shared responsibility, and accountability (36).

To standardize the role and scope of practice of ONPs the ONS published the first set of competencies in 2007, based on a review of roles, and scope of practice in 2016, and updated competencies in 2019 (37,38). The competencies provide the framework for the ONP role and responsibilities on the interprofessional cancer care team and describe ONP clinical practice across various settings, including clinical practice, academics, administration, and healthcare policy.

In Canada, masters-prepared oncology nurses are being incorporated into cancer programs as APN, nurse navigators, and nurse educators (39). Often their roles are crafted to meet the needs of specific populations such as tumor or treatment-focused roles (breast cancer, lung cancer, hematopoietic stem cell transplantation) or roles

for particular groups such as adolescents and young adults (AYAs) with cancer (40). Most of the 10 provinces and three territories have APNs in oncology that provide advanced nursing care to either adult or pediatric patients with cancer and their families (41). These individuals are also engaged in quality improvement and nursing research activities with a goal of increasing the quality of cancer nursing care.

Intersection of palliative care, symptom management, and supportive care with specialty cancer care

In 1985, Saunders and McCorkle described a gap in cancer care, along the "living-dying model" where nurses could advocate for patient-centered care including symptom management and transitions to end-of-life care (42). Given the later stages of diagnosis and shortened life span during the 1900s, nurses frequently cared for patients with cancer at the end of life. Now, oncology, palliative care, and hospice care have each evolved into specialties in medicine and nursing. Today, curative-intent cancer treatments can cause symptoms that require supportive care, palliative treatments may require goals of care discussions, and disease-directed treatments may prolong life in cancers that are not curative but controllable (43). More recent models (e.g., EMPOWER) of integrated palliative and oncology care have demonstrated the role of psychoeducational interventions to improve patients' knowledge and attitudes about palliative cancer care as well as improvements in quality of life and decreased emotional distress (44,45).

There is a growing body of literature demonstrating that early palliative care, even in curative-intent contexts, is associated with a number of favourable outcomes, including: improved symptom management, better prognostic understanding, improved quality of life for patients and family caregivers, and even improved patient survival (46-48). In contrast, lack of palliative care (PC) involvement is associated with a number of adverse end-of-life outcomes, such as: overuse of life-sustaining therapies, aggressive treatment (including chemotherapy) in the weeks preceding death, intensive care unit admissions, more emergency department visits and hospitalizations, and underuse of hospice, comprehensive pain and symptom management, and psychosocial and spiritual care support (49).

CANO/ACIO has identified that understanding of palliative care is a standard competency of the specialized oncology nurse (50). Further, CANO/ACIO endorses the Canadian Nurses Association, the Canadian Hospice Palliative Care Association, and the Canadian Hospice Palliative Care Nurses Group position statement on the palliative approach to care and the role of the nurse. In particular, the position statement asserts that all nurses should possess the basic skills and competencies to adopt a palliative approach to care (51).

Professional organizations and societies for oncology nurses

As cancer care and oncology nursing evolved, nursing leaders saw the need to establish societies and associations to educate and train nurses in cancer care, create guidelines, develop resources, and share evidence on best practices in oncology (52,53). The first National Cancer Nursing Research Conference was held in 1973 in the United States with support from the American Cancer Society (54). In 1975, the ONS was founded in the United States and reported 488 members in its charter membership in 1976 (54). The first two cancer nursing journals were established in 1978: the *Oncology Nursing Forum* (published by ONS) and *Cancer Nursing*: *An International Journal for Cancer Care* (54).

Oncology nursing in Canada began with the development of networks of cancer nurses in various provinces across the country. These networks were closely aligned with existing cancer centres in urban settings. In 1984, a group of 16 nurses, representing cancer nursing in 10 Canadian provinces, began working to establish a national oncology nursing organization (55). In September 1985, the CANO/ACIO was founded (55). The first issue of the *Canadian Oncology Nursing Journal* (*CONJ*) was published in 1991. The *CONJ* is peer-reviewed, published quarterly, and is the only cancer nursing journal that is bilingual, offering articles both in English and French (56). CANO/ACIO's vision is to be a recognized leader in pursuing cancer care nursing excellence and improving access and equity, nationally and internationally and CANO/ACIO's mission is to advance cancer care nursing through advocacy, collaboration, the provision of practice resources, education, research, and leadership for the benefit of all people living in Canada (57).

Both oncology nursing associations, CANO/ACIO and ONS, have been active participants in the International Society of Nurses in Cancer Care (ISNCC). The ISNCC was founded in 1984 (58). As of 2015, ISNCC members represented more than 50 countries and ISNCC membership included 45 member organizations such as CANO/ACIO and ONS, 68 association members, and more than 1,000 individual members (59). ISNCC collectively represents more than 60,000 nurses worldwide (60). The ISNCC's vision is to "lead the global nursing community in

cancer control" and mission is "to maximize the influence of nursing to reduce the global burden of cancer" (59).

Other professional organizations have also formed to support cancer nurses. The Academy of Oncology Nurse and Patient Navigators (AONN) was founded in 2009 to provide "a network for all professionals involved and interested in patient navigation and survivorship care services to better manage the complexities of the cancer care treatment continuum for their patients" (60). The Association of Pediatric Hematology/Oncology Nurses (APHON) was formed after an impromptu meeting of four nurses in 1973 (61). The organization has members in the United States and Canada and offers annual meetings, education and certification CPHON (Certified Pediatric Hematology Oncology Nurse) through the ONCC to improve the outcomes of children and AYAs with cancer.

Today's challenges and tomorrow's opportunities

Oncology nurses in North America face an array of challenges. Priority areas to address include: disparities in cancer care, pandemic-related changes in care delivery and clinical trials, ensuring education and policy keep pace with the ever-changing treatment landscape and emergence of novel therapies, and the provision of comprehensive, high-quality cancer care. These will be discussed in more detail below.

Disparities in cancer care

Disparities in cancer care have been well-described in the literature and may exist for a multitude of reasons, including (but not limited to): race/ethnicity, sexual and gender identity, place of residence/geography (rural), and sociodemographic factors, to name a few (62-64). Both CANO/ACIO and ONS are committed to addressing disparities in cancer care, within North America and globally.

In their critical analysis of cancer disparities and access to cancer care among First Nations Peoples in Canada, Horrill *et al.* (65) describe inequities in access to cancer care throughout the disease trajectory, including cancer screening and detection, treatment, survivorship, and palliative care. The authors outline how First Nations Peoples who experience challenges with access to care may be diagnosed with later stage disease and that First Nations Peoples continue to have worse overall survival outcomes compared to non-First Nations Peoples (65). In Alberta, an Indigenous Cancer Patient Nurse Navigator role was developed. In addition to assisting patients with treatment, managing various barriers and challenges, advocating for patients, the Indigenous Cancer Patient Nurse Navigator also helps improve healthcare providers' understanding of First Nations Peoples' culture and historical trauma (66).

Disparities in cancer care access, care, and outcomes exist in the United States as well. Despite advances in cancer care diagnostics and treatments and the passage of the Affordable Care Act, populations continue to experience disparities in outcomes based on intersections of race/ethnicity, geography, sexual orientation and gender identity, sociodemographic factors, and others (67). For example, people with cancer who self-identified as black have reported higher symptom burden and more severe symptoms than people who self-identify as white (68). Cancer care organizations such as ONS have published position papers on disparities including transgender, gender nonconforming, and nonbinary people (69). Oncology nurses provide a global voice to advocate for all patients and encourage awareness that will promote equity in access to cancer care including screening and treatment, and improve supportive and palliative care.

Coronavirus disease 2019 (COVID-19) pandemic and cancer care

The COVID-19 pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has laid bare gross inequities in healthcare and has presented numerous opportunities that compel us not to go back to normal but rather, to go forward to a better normal (70). As one example, in response to the known increased risk of adverse outcomes of SARS-CoV-2 infection in patients with cancer, many cancer centers shifted to virtual cancer care (71-73). There are a number of benefits of virtual care for patients, their family caregivers, and the healthcare system such as reduced exposures to infectious pathogens, improved access to care, reduced costs associated with travel and parking to attend in-person appointments, and increased convenience and comfort for patients and their caregivers, to name a few (74). CANO/ACIO is working on creating a best practices document to provide guidance for oncology nurses involved in virtual cancer care to help ensure that virtual cancer care is safe and equitable for all.

Disruptions to cancer prevention and screening services throughout the pandemic mean that we now face the

potential that people have been living with undiagnosed and untreated cancer and that people may be diagnosed with later stage disease, ultimately leading to poorer outcomes (75). Further, many patients who had been diagnosed with cancer before or during the pandemic experienced treatment delays or even cancellations. Public health restrictions, necessary in order to curb the spread of COVID-19, meant that customs and rituals typically observed when someone is dying or has died, were altered (such as the shift to virtual funerals) or abandoned altogether (76). The subsequent impact on grief and bereavement remains unknown but it is anticipated that challenges with disordered grief may arise in the years to come. Oncology nurses will play an integral role in helping patients and their loved ones cope and contend with the ongoing challenges associated related to the pandemic.

Evolving treatment landscape

Oncology is a dynamic, evolving field and novel therapies are rapidly being approved, bringing more hope for cure and cancer control. However, newer treatments such as immunotherapies, targeted therapies, and chimeric antigen receptor (CAR) T-cell therapies, all come with unique side-effects and acute- and long-term toxicities. Therefore, oncology nurses require ongoing education and training as new treatments are approved. In addition, education and policy on occupational exposure to novel therapies must keep pace with the emergence of such therapies. Oncology nurses need to advocate for both cancer survivors as well as the safety of health care providers and caregivers preparing and administering these treatments.

As developments in cancer therapeutics progress, and it is hoped, continue to lead to improvements in patient survival and quantity of life, comparable attention must be given to quality of life. Many survivors are now living with their cancer for many years after initial diagnosis and treatment. The 2019 meeting of the National Cancer Institute highlighted six key areas of cancer survivorship to meet the needs of people after a cancer diagnosis: surveillance for recurrences and subsequent new cancers, late and long-term physical effects, late and long-term psychosocial effects, health promotion, care coordination, and financial impact (77). Ongoing follow-up care and surveillance testing during survivorship is necessary to ensure tracking of adverse effects of treatment and early detection of cancer recurrence or the development of new cancers. Survivorship care is often provided by APNs but, to meet the growing number of cancer survivors, other health care providers, including primary care providers and hospitalists, will require training on survivorship issues and may provide care that is more cost effective (78).

The specialty of oncology nursing has developed in an orderly progression from on-the-job training to continuing education to academic preparation (79). Oncology nurses, societies, and associations must be stewards of the past and chart the future of the profession (80). Over the last nine decades, oncology nursing has seen changes in the definition of nursing, regulation of the profession, increased scope of practice and more educational preparation and certification. This speaks to the viability, adaptation, and elevation of the profession. With challenges from pandemics, rapid escalation in novel treatments and oral therapies, changing settings of care, and the integration of digital and telehealth, oncology nursing must continue to evolve as an integral part of interprofessional clinical, academic, and research teams in order to meet the needs of people living after a diagnosis of cancer. These challenges come at a time when the nursing profession and indeed, healthcare providers more broadly, face significant risks of burnout and attrition (81,82). A role of professional nursing associations, such as CANO/ACIO and ONS, is to provide support and networking opportunities (83). In 2022, the International Atomic Energy Association and World Health Organization published the first framework for cancer care centers; *Setting Up a Cancer Centre*: *A WHO—IAEA FRAMEWORK* (84). This landmark publication incorporated oncology nurses as authors of the publication and established specialty trained oncology nurses as integral members of cancer teams globally.

Conclusions

The profession of oncology nursing has evolved over the past 90 years with dramatic progress made in the 21st century. The roles and responsibilities of oncology nurses have rapidly transformed from general nurses providing bedside comfort care with few technological advances to advanced practice oncology nurses responsible for everything from performing invasive procedures such as bone marrow aspiration, and biopsies, to diagnostic interpretation and screening for cancer prevention. Oncology nurses have been vital to the successes in cancer care and play an integral role in current and future advances in cancer control from prevention through survivorship. However, oncology nurses know that while

people may complete cancer treatment, they may continue to have long-term side effects that impact their physical, psychosocial, and spiritual well-being. Oncology nurses also know that more needs to be done to improve access to care for underserved populations such as people with advanced or metastatic disease, Indigenous Peoples, sexual and gender minorities, AYAs with cancer, adult survivors of pediatric cancer, and those who reside in rural and remote locations. As cancer care continues to evolve, nurses will play a key role in the field of oncology, whether as specialized oncology nurses providing clinical care, or as nurse researchers spearheading ground-breaking oncology research. Oncology nurses will inevitably rise to new challenges and find innovative ways to advance cancer care and support people with cancer and their loved ones.

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