Advances in radiation therapy technologies, including imaging, treatment planning and administration, and new systemic radioprotective and radiosensitive agents, have allowed radiation oncologists to expand treatment options for patients with cancer, resulting in more patients receiving therapy with curative intent. As a result, the role of the RN has evolved from that of clinical assistant to one of clinical expert in the evaluation and management of patients receiving radiation therapy. This evolution has been slow, and many nurses continue to provide “clinic care” and clerical assistance despite the opportunity and need to provide expert patient care. This article will explore the opportunities available for RNs in radiation oncology within the conceptual framework developed for ambulatory care nurses by the American Academy of Ambulatory Care Nursing (AAACN).

Purpose/Objectives: To describe the professional opportunities for licensed nursing personnel in radiation oncology within the conceptual framework developed for ambulatory care nurses by the American Academy of Ambulatory Care Nursing (AAACN).

Data Sources: Published articles and books.

Data Synthesis: Using AAACN’s framework, the researchers identified three roles that are part of every ambulatory care nurse’s practice and can be readily customized to radiation oncology: an organizational/systems role, a professional role, and a clinical nursing role. Incorporating the described framework into a radiation oncology nurse’s job description can lead to maximizing the use of the professional staff member within the radiation oncology department. This level of professional utilization and validation of the radiation oncology nurse will lead not only to improved patient outcomes but also to greater professional satisfaction, resulting in improved retention.

Conclusions: The complexity of oncology therapies demands expert oncology nurses. This clearly is recognized in medical oncology, and patients with cancer who are being treated with radiation are no less important. To optimize patient care and therapeutic outcomes, the integration of nursing in all aspects of the radiation treatment continuum is essential.

Implications for Nursing: Radiation oncology nursing is an evolving subspecialty. Nurses can use the information in this article to evaluate their current roles and individual potential for further professional growth.

Key Points . . .

➤ To optimize patient care and therapeutic outcomes, the integration of nursing in all aspects of the radiation treatment continuum is essential.

➤ The American Academy of Ambulatory Care Nursing conceptual framework is a useful tool that can be applied to the role of professional radiation oncology nurses and help define specific roles and responsibilities.

➤ Within the framework, three specific roles can be identified: an organizational/systems role, a professional role, and a clinical nursing role.

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framework developed for ambulatory care nurses by the American Academy of Ambulatory Care Nursing (AAACN) and the American Nurses Association (ANA) (1997).

Ambulatory Care Nursing

Ambulatory care nurses work with patients who seek care for health promotion, health maintenance, or health-related problems in community-based or academic settings. Encounters are episodic and may occur once or in a series lasting days or weeks. Encounters may be face to face or via telephone or other communication devices. Nursing services focus on cost-effective ways to maximize wellness and prevent illness, disability, and disease. They also support patients during the management of chronic disease to effect more positive health states throughout the lifespan up to and including a peaceful death (AAACN & ANA, 1997). The practice of radiation oncology primarily is ambulatory in nature. This entitles radiation oncology nurses to follow the conceptual framework developed for ambulatory care nurses, including clinical, management, educational, and research activities (AAACN & ANA).

Ambulatory care nurses, including radiation oncology nurses, practice within several distinct organizational settings. The characteristics of a setting are determined by its organizational structure, patient population, financial and reimbursement structure, and organization of its primary providers (usually physicians). Within each type of setting, differences may be based on size, regional location, affiliation with a healthcare system(s), and regional differences in healthcare finance administration. The dimensions of clinical nursing practice are similar across settings; however, the frequency of performance of certain dimensions varies a great deal by setting (Haas, 1998; Hastings, 2001). The current consensus regarding role dimensions in ambulatory nursing is shown in Figure 1.

The AAACN Ambulatory Care Nursing Conceptual Framework (ACNCF) was developed by an AAACN expert member think tank in 1998 (see Figure 2). The panel identified three roles that are part of every ambulatory care nurse’s practice and can be readily customized to radiation oncology. They are an organizational/systems role, a professional role, and a clinical nursing role. Ambulatory care nurses use the organizational/systems role when they manage and coordinate resources and workflow in their settings. They use the professional role as they continuously practice according to standards, evaluate the outcomes of practice, and develop themselves and other staff. Finally, they use the clinical nursing role as they provide care within each of the clinical dimensions (Haas, 2001). ACNCF assumes

- Patients’ health status is dynamic and changes between encounters such that people with acute illness at one encounter may be well at the next and chronically ill patients may have acute exacerbation at intervals.
- The overall goals of ambulatory care nurses are to foster and maintain health, prevent illness, diagnose illness early and treat it effectively, prevent complications, and initiate rehabilitation early to regain optimal functioning.
- People at all stages of the health-illness continuum could benefit from nursing interventions at the primary, secondary, and tertiary prevention levels.

Organizational/Systems Role

The quality of patient care provided in an ambulatory setting is dependent on both the soundness of the delivery systems and environmental supports as it is on the skills and abilities of providers (Angiulo & Dickey, 2001). Included within the organizational/systems role are patient scheduling, facility design, and environmental management.

Scheduling is a critical part of quality care in radiation oncology. Efficient scheduling enhances the use of support staff (e.g., therapists, dosimetrists), space (e.g., simulation and treatment machine time), and ancillary services (e.g., clerical, laboratory, radiology) and improves visit planning with regard to financial matters, prior tests and reports, and specific patient preparation (Angiulo & Dickey, 2001). In radiation oncology, numerous variables, including patients, providers, support services, and scheduling system features, have to be taken into account when scheduling activities for patients.

Patient variables include the urgency of the identified problem or follow-up, availability of the patient (i.e., patient’s personal or work schedule), availability of transportation (e.g., wheelchair, stretcher), and availability of family for assistance or interpretation (e.g., disability or foreign language needs). Provider variables include availability of the healthcare provider, required pre-evaluation testing, third-party payor requirements, and any previsit planning requirements (e.g., bowel preparation, premedications). Radiation oncology scheduling system features significantly affect the process of scheduling. Variables include availability of the simulation or treatment machines, dosimetrists, and physics staff to design immobilization devices and plan treatment, and the required sequencing of these procedures to develop a quality plan of care. If patients also are receiving systemic chemotherapy or other agents that must be given immediately before or after radiation treatment, scheduling can be more difficult.

Radiation oncology nurses have the expertise to navigate the maze of variables, evaluate patients individually, prioritize the importance of each variable to the plan of care and to the patient, and collaborate with appropriate staff (e.g., clerks, social workers, other healthcare providers) to develop an appropriate and timely schedule. They play a central role in working with patients and families to ensure access and the correct provider, time frame, and level of care. In turn, they can delegate tasks such as completing x-ray requests or phone scheduling to designated clerical staff.

Nurses can play a major role in the design of work places that are functional and have good flow and productivity. This role includes input into facility planning, design, and oversight and awareness of how space affects productivity and quality

Figure 1. Role Dimensions in Ambulatory Nursing

of care (Angiulo & Dickey, 2001). Their day-to-day use of these spaces to provide care, their advocacy for patient comfort, and their understanding of regulations such as the American College of Radiology, Americans with Disabilities Act, Occupational Safety and Health Administration (OSHA), Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and local safety codes enable them to recognize factors that should be taken into consideration during the design, planning, and execution of space utilization. In radiation oncology, nurses can play a key role in two areas. The first is in patient flow through the department, including check-in, the clinical care area, the treatment planning area, and treatment machines. The second is the flow of patient care through the clinical care area. Nurses can assist in the evaluation of layout and design issues, including adequate seating; waiting room space; storage space (e.g., clean and soiled holding spaces); counter space; computer space; examination and direct care rooms, including ergonomic requirements of various examinations (e.g., pelvic examinations, endoscopy procedures); special lighting needs; special work spaces, including medication preparation areas and film review areas; and charting and dictation areas.

Nurses in radiation oncology also play an important role in the evaluation of the patient care environment, development of safety plans and procedures, and necessary staff orientation and continued assessment of competency. Such accountability provides a safe, accessible, effective, and functional environment of care. Figure 3 lists environmental management responsibilities that should be included in this role.

Another facet of the organizational/systems role is the management of clinic equipment and supplies. Responsibilities include selection and purchase of equipment and supplies, inventory control, ongoing monitoring to ensure equipment is safe and functional, coordination of routine preventive maintenance of clinic equipment, storage space organization, and development of procedures for recyclable or refuse materials. In addition, nurses can determine the cost of individual medical supplies, integrate basic supplies into procedure charges, and develop charge schedules based on applicable reimbursement coding. For example, patients who receive IV radioprotective agents before radiation treatment will require a number of IV supplies, multiuse patient equipment (e.g., IV pumps), and nursing time to initiate and monitor infusion. Depending on the financial and reimbursement practices of the department, these supplies may be included in the treatment plan or billed separately.

Other areas of expertise that radiation oncology nurses bring to a department are an understanding of the economics of health care, informatics skills, familiarity with the legal aspects of the patient care environment, a sense of patient advocacy, and experience with staffing and workload issues. Radiation oncology nurses must understand the economics of health care and their role in controlling costs. Although the responsibility for the department’s annual budget is that of the administration and accounting personnel, nurses should understand the basic financial concepts that affect the cost of healthcare services and be able to apply the concepts to the development of clinical guidelines and decision pathways that direct care. The specific role focuses on integrating the plan of care, measuring results.
1. Recognize and evaluate individual patient safety factors.
   - Physical disabilities
   - Mental status changes and judgment
   - Effects of medications
2. Assess the need for furnishings and equipment suitable for patients with cancer being treated with radiation.
   - Age- and size-appropriate
   - Special needs (e.g., blind, large, or obese patients)
3. Develop and implement plans to monitor and control recalled products and medical devices.
4. Equip the environment to promote staff and provider safety.
   - Patient transfer and lifting devices
   - Examination and procedure tables
   - Equipment and protective apparel to prevent transmission of infectious agents
5. Develop and implement plans for hazardous materials and waste management plans.
   - Handling, storage, use, and disposal procedures for hazardous materials (e.g., radioactive sources, blood- or chemotherapy-soiled items, medical device cleaning agents)
   - Plan for management of hazardous material spills
6. Risk management
   - Report and investigate all incidents of injury, property damage, exposure, and occupational illness.
7. Develop and implement security plans for the facility.
   - Medications and prescription pads
   - Patient identification prior to procedures
   - Identification procedure for staff and employees
   - Plan for security emergencies (e.g., patient agitation)
8. Develop and implement plans for medical emergencies and disasters.
   - Internal and external disasters procedures (e.g., fire, explosion, weather related)
   - Emergency supply cart with appropriate, age-specific equipment
   - Procedure for patient transportation to emergency facility
   - Documentation procedures during and after emergencies
   - Requirements for basic life support (e.g., annual training, documentation)
   - Plans for utilities disruption or failure
   - Plans for disaster supplies and equipment
   - Evacuation procedures
9. Develop and implement infection control procedures.
   - Identification of potential health risks
   - Competency assessment with infection control procedures (e.g., equipment cleaning)
   - Procedure for cleaning rooms daily, weekly, and between patient examinations
   - Monitor and maintain refrigerators
   - Infection monitoring program
10. Staff orientation and annual competency assessment
    - Management of hazardous materials and waste
    - Security procedures
    - Role and responsibilities in medical and disaster emergencies
    - Infection control

**Figure 3. Environmental Management Responsibilities**

(outcomes), educating patients, and ensuring access to care (Noa & D’Angelo, 2001). With the vast amount of documentation required by third-party payors and national and state disability organizations, radiation oncology nurses can facilitate accurate billing, reduce losses, and improve patient satisfaction by carefully documenting procedures performed, directing patients to authorized facilities for ancillary services (e.g., laboratory, radiology), and ensuring that prescriptions are written within the payors’ drug schedules. These activities result in lower costs, higher quality, and continuous improvement (Noa & D’Angelo). Radiation oncology nurses, particularly those in supervisory or management positions, also should be prepared to participate in the development of departmental or clinical budgets, plans of care that take into account third-party payor limitations, resource management, capital budgets, operating budgets, and key performance indicators.

Radiation oncology nurses should be familiar with a range of healthcare information technology applications, including hospital-based programs and radiation oncology programs that are applicable in clinical practice, administration, patient and professional education, and research. In addition, nurses should understand how to best use informatics and technology to improve the quality of patient care and support professional practice and be able to evaluate any risk to their patients or practice environments as a result of the technology applications (e.g., patient confidentiality) (Androwich & Mourek, 2001). Radiation oncology practice activities supported by computers include scheduling procedures, retrieving test results, keeping computerized patient records (i.e., documentation of weekly treatment visits and medications), designing treatment plans, and implementing those plans on the treatment machines. Other uses of informatics include quality management programs; censuses; research support, including literature searches; and data storage and analysis.

Nurses’ familiarity with the legal aspects of providing quality health care also can be assimilated into practice in radiation oncology. In radiation oncology, an essential part of patient care is obtaining informed consent before treatment. Nurses’ ability to educate patients can significantly enhance the informed consent process. Nurses can evaluate patients for potential barriers to informed consent, including mental competency, age, and ability to read and comprehend English. When barriers are identified, nurses can facilitate resolution through consultation with auxiliary services such as legal, social work, or community-based programs (e.g., foreign language specialists).

The other domain of healthcare legalities in which nurses are valuable is the regulatory compliance arena. The quality of services provided in an ambulatory healthcare setting is subject to external monitoring by government agencies, third-party payors, consumer groups, and the legal system (Laughlin, 2001). The practice of radiation oncology involves numerous regulations that mandate safe working conditions, equipment safety and accuracy, and third-party payor billing procedures. Physicians and administrators are at risk for a limited vision of all the regulatory and compliance issues in the radiation oncology workplace, and nurses can provide essential expertise. Nurses can be responsible for regulatory compliance as it relates to the clinical care area, including OSHA, JCAHO, and Centers for Disease Control and Prevention regulations and the legal aspects of documenting patient care procedures. Nurses can monitor performance and measure outcomes of care delivery against standards, exercise processes for ongoing improvement, and maintain a system of checks and balances for prevention, detection, and management of problems and errors in care delivery. Additionally, nurses can assist in organization self-assessment to reduce risks to patients, visitors, and staff; ensure high quality of care; and minimize potential legal and financial liability (i.e., risk management) (Laughlin).

**Professional Role**

The professional role of radiation oncology nurses includes engaging in evidence-based practice; exercising leadership
skills; participating in research, continuous quality improvement projects, and staff development; and recognizing potential ethical dilemmas. These activities provide nurses with the basis for practicing according to standards, evaluating the outcomes of practice, and developing themselves and others (Haas, 2001).

Evidence-based practice combines research and clinical expertise (Simon, 1999). It provides for the delivery of care and establishes a method for evaluating performance. The intent is to provide patient care based on the best scientific evidence that is supported by expert opinion (ANA, 1995; Goode & Piedalue, 1999). In radiation oncology, nurses should participate in the development and execution of clinical practice guidelines, critical pathways or care maps, clinical indicators, standards of care, and clinical policies and procedures. These approaches assist department personnel in clinical decision making, provide a framework for evaluating the department’s delivery of care, guide resource allocation, and reduce the risk of liability. A similar critical aspect of practice is continuous quality improvement. The current focus is on problem-solving techniques to improve processes, achieve outcomes, and subsequently make continuous quality improvements. For example, radiation oncology nurses’ expertise and use of a holistic framework can assist in the development of policies or procedures for the care of patients with diabetes who require head and neck radiation therapy. Such patients require a careful balance of diet, medications, and exercise to maintain normal glucose levels, all of which may be affected by expected mucositis, loss of appetite, and dysphagia. A department’s policy should include evaluation of patients’ current diabetic protocol, current symptoms related to head and neck disease, homecare support, financial support, and collaboration with endocrinology to develop a plan of care to facilitate patients’ ability to tolerate treatment without multiple episodes of hypo- or hyperglycemia, which may require treatment breaks and unsatisfactory outcomes.

Another aspect of the professional role is one of leadership. Ambulatory care nurses use leadership skills as they care for individual patients and families, supervise the work of others, develop programs for patient populations, and initiate change in organizations. The following scenario illustrates this process. A radiation oncology nurse recognizes that a number of patients who received radiation therapy that included the heart were found to have elevated lipid profiles on return examinations. However, the nurse is concerned that the patients were not receiving adequate education regarding the meaning of these results and the appropriate management of hyperlipidemia. Realizing that radiation oncologists are not experts in this disease, the nurse develops a basic education tool for patients based on the National Institutes of Health education brochure and a letter describing abnormal values. The letter urges patients to read the enclosed education materials and make appointments with their primary care providers to establish long-term plans of care and surveillance. This process not only enhances the practice of the radiation oncology department but also ensures quality patient care and promotes collaboration with medical colleagues.

Nurses also should participate in and use research within their practice. Although many radiation oncology nurses currently participate in cooperative group clinical trials, as well as departmental trials, few nurses conduct nursing research within their departments or do not recognize that some of their current evaluation processes can be incorporated into nursing research projects. However, nurses should use research data in their practice to increase the potential for better outcomes, reduce uncertainty and variability in healthcare decision making (e.g., skin care procedures), reduce costs, and increase patient and professional satisfaction. Indeed, the management of outcomes, including clinical, humanistic (i.e., quality of life and behavioral), and economic, is the hallmark of nursing practice and should be the focus of a significant portion of nurses’ time in radiation oncology (Watkins-Bruner & Hanks, 2001).

Staff development responsibilities include not only development of nursing colleagues within the department and other staff members who affect patient care, but also a degree of nursing self-care. A number of professional mandates require annual continuing education, yearly competency evaluations, and documentation of new skills. In addition to such requirements, nurses are responsible for developing their body of knowledge and being aware of changes in practice standards. A variety of methods for continuing professional education exist, including membership in professional organizations, professional journals, distance learning, and additional formal education (e.g., graduate education).

The final aspect of the professional role is the recognition of potential ethical dilemmas. In radiation oncology settings, dilemmas may include patient confidentiality issues, management of complex family dynamics, the need to know versus the right to know, end-of-life care issues, quantity-versus quality-of-life issues, managed care restrictions on care provided, maintenance and adherence to standards of care, and differences in care based on reimbursement sources. Nurses’ role is one of assisting colleagues, patients, and families through identification of a dilemma; educating the individuals involved; and referring to institutional ethics committees or appropriate administrative committees as needed.

Clinical Nursing Role

The clinical nursing role in radiation oncology is extensive and includes patient assessment and triage, prioritization, collaboration, education, intervention, documentation, and evaluation. Despite the relatively few skilled nursing procedures (e.g., invasive procedures) performed during a course of radiation, this subspecialty requires nurses to have a broad oncology knowledge base and excellent communication skills. Nurses in radiation oncology provide a continuous and visible presence for patients and families during treatment and surveillance, which can have a significant effect on quality of care and patient satisfaction.

Patient assessment and triage include the collection and evaluation of physical, psychosocial, sociocultural, spiritual, and economic data. Because a course of radiation therapy may be a complicated process with numerous visits and potential for treatment side effects, nurses play an important role in evaluating factors that may further complicate the course of treatment or create barriers to effective treatment. Assessments should be conducted during initial evaluation, weekly treatment visits, and follow-up surveillance. Nursing assessment of patients during initial evaluation should be comprehensive and include a history of the present illness, symptom distress, review of systems, and assessment of functional, cognitive, and sensory abilities. In addition, psychosocial data should be obtained, including patient and family cultural values, lifestyle and beliefs, current quality of life, and available resources for personal care, housing, transportation, finances, and social support. Assessment also should include careful examination of

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patients’ and families’ understanding of the illness, treatment recommendations, and the potential effects of the treatment. After data are collected, nurses should focus on the urgency of the needs assessed, develop a priority list, and collaborate with other healthcare professionals to develop a plan of care. In radiation oncology, this collaborative effort may include medical oncology; other oncology specialties, including surgery, oral oncology, dietary, social services, and clinical psychology; and rehabilitative services such as physical, speech, and occupational therapies. A comprehensive plan of care should be developed to address current and potential problems.

The most important clinical role that nurses in radiation oncology play is one of patient and family advocate and educator. The profession of nursing has embraced patient education as central to the nursing process and role. Patient education plans are part of total plans for patient care and are targeted to priorities for each patient. In radiation oncology, informed consent, initiation of treatment, management of treatment side effects, completion of treatment (e.g., discharge instructions), and the prevalence for chronic health problems require continuous patient education.

The goal of patient and family education in radiation oncology should be to facilitate understanding of the current diagnosis, health status, treatment options, and consequences of those options. In addition, nurses should encourage patient and family participation in the decision-making process (i.e., advocate role), which will improve compliance with the plan of care, maximize patient and family care skills, and increase their ability to cope with illness, treatment, prognosis, and outcomes (Haas & Haslam, 2001). Continuous assessment and education during the surveillance period should enhance patients’ and families’ roles in continuing care and promote a healthy lifestyle. The scope of patient education needs in acute care includes a review of the diagnosis, including etiology and contributing factors; potential complications; treatment, including self-care behaviors; aggravating factors; prognosis; prevention of recurrence; and resources for assistance.

Another important aspect of the clinical nursing role is that of telehealth nursing, defined by AAACN as “nursing practice using the nursing process to provide care for individual patients or defined patient populations over a telecommunication device” (AAACN, 2001, p. 3). Telecommunication devices include telephones, e-mail messages, the Internet, facsimile transmissions, telephone devices for the deaf, and telemedicine programs. In radiation oncology, telephone and e-mail triage consume a considerable amount of time because many patients complete therapy and return to their communities with acute side effects of therapy that may take weeks or months to resolve. In addition, many patients require medication refills, inquire about surveillance studies, develop new symptoms, or require reassurance about long-term recovery. Nurses can provide triage and disposition, instruct and provide information about care issues, counsel, coordinate other healthcare resources or referrals to appropriate healthcare providers, and evaluate patients’ or healthcare providers’ understanding and ability to participate in the plan of care.

Summary

The role of nurses in radiation oncology incorporates expertise in organizational systems, professional practice, and clinical practice that can have significant effects on improving clinical, humanistic, and economic outcomes for patients. In addition, nurses contribute to expert care, optimum treatment and quality-of-life outcomes, coordinated multidisciplinary management, patient and staff safety, and the overall health of radiation oncology departments. The complexity of oncology therapies demands expert oncology nurses. This clearly is recognized in medical oncology, and radiation oncology patients are no less important. To optimize patient care and therapeutic outcomes, the integration of nursing in all aspects of the radiation treatment continuum is essential. Incorporating the framework described in this article into radiation oncology nurses’ job descriptions can lead to maximizing the use of these professional staff members within radiation oncology departments. This level of professional utilization and validation of radiation oncology nurses will lead not only to improved patient outcomes, but also to greater professional satisfaction, resulting in improved retention.

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