



# Advanced Practice in Radiation Therapy

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*Published by the American Society of Radiologic Technologists, 15000 Central Ave. SE, Albuquerque, NM 87123-3909.  
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# **Advanced Practice in Radiation Therapy**

## **Introduction**

The continuously changing health care system demands the highest level of practice from professionals.<sup>1</sup> Today's radiation therapists are pushing at traditional boundaries for their profession. Technological advances, increased demand for cancer services and the need for patient-centered cancer care require the involvement of dedicated professionals. These dynamics also call for participation of select radiation oncology experts who can effect change, teach and lead peers and accept greater responsibility<sup>2,3</sup> (Amanda Bolderston, M.Sc., M.R.T.(T), clinical education program manager, Princess Margaret Hospital, Toronto, oral communication, February 20, 2007). Some radiation therapists have expressed the desire for professional advancement opportunities.<sup>2,5</sup>

In September 2004 the American Society of Radiologic Technologists (ASRT) convened a group of radiation therapy professionals, the Radiation Therapy Clinical Practice Advisory Panel, or RTCPAP, to consider, among other topics, the issue of establishing an advanced practice level for radiation therapists in the United States.<sup>4</sup>

This white paper describes ASRT activities, discussions and findings to date concerning advanced practice for radiation therapists, as well as reports on advanced practice in other countries and professions. Examination of the literature and of other professions can provide important comparisons, successful approaches to advanced practice and lessons learned.

In other countries – primarily the United Kingdom and Canada – professional factors have joined government-led initiatives to drive advanced practice roles for radiation therapists. Other medical professions in the United States have created advanced practice or physician extender models in recent years to cover gaps in care, increase efficiency,<sup>2,6,7</sup> promote professional development and support physician services.

The addition of the radiologist assistant (RA) to the U.S. diagnostic imaging career ladder offers a prime example of expanding the scope of radiologic technologists' services to extend the physician's capabilities. RAs took their first certifying examination in October 2005.<sup>8</sup> Although the factors driving advanced practice for medical imaging and radiation therapy may differ, much can be learned from the RA experience (Radiation Therapy Clinical Practice Advisory Panel, meeting minutes, September 2004).

Advanced practice professionals require appropriate training and education. In the last decade, several countries, including Australia and the United Kingdom, have set the bachelor's degree as the entry-level standard for radiation therapists.<sup>2</sup>

In the United Kingdom, many issues led to the development of expert practice levels for therapy radiographers. The National Radiotherapy Advisory Group looked at the needs of

the country's growing and aging population and determined there not only was a requirement for a larger work force, but also for a work force functioning in different radiation therapy roles. The Society of Radiographers (SOR) is pushing to meet those needs, says Charlotte Beardmore (Charlotte Beardmore, B.S.,(R)(T), FCR, DCR, DMS, professional officer – radiotherapy, The Society and College of Radiographers, oral communication, February 23, 2007).

## **Factors Driving Advanced Practice**

Cancer care is different from other medical care; it represents a complex set of diseases managed by a multidisciplinary team of health care workers who perform multimodality examinations and treatments. Technological advances allow professionals to better treat cancer. At the same time, improved treatment has led to an increasing number of cancer survivors who face gaps in follow-up care. Even patients still under active treatment may fall victim to poorly coordinated care.<sup>9</sup> The National Cancer Institute reports that while deaths from cancer in the United States continue to decrease, the rate of new cancers diagnosed remains stable.<sup>10</sup> Age is the greatest risk factor for cancer and with a coming boom in the elderly population, the number of people with cancer will continue to increase. By 2050, 2.6 million people, or double the number in 2000, will have the disease.<sup>11</sup> The American Society of Clinical Oncology (ASCO) has predicted that the demand for cancer services will increase 48% between 2005 and 2020.<sup>12</sup>

The goal of oncology services is high-quality treatment. To accomplish this goal and effectively manage resources, health care administrators must address the skills mix and expertise of individual team members who deliver treatment.<sup>7,13</sup> Published research on advanced nursing roles has stated that the demand for nurse practitioners has historically derived from "a need to offset physician shortages and to render health care more inexpensively."<sup>14</sup> Roles such as the nurse midwife and the nurse anesthetist blend nursing and medicine.<sup>14</sup>

The demographics of the oncology work force follow the trends of the general population with respect to aging and retirement.<sup>15</sup> The 2004 Environmental Scan of the Radiation Therapist's Workplace, a study conducted by the ASRT, reported a mean staff radiation therapist age of 40.1 years.<sup>5</sup> A 2002 study by the American Society of Therapeutic and Radiation Oncology (ASTRO) reported an average 18.9% increase in staff needed across academic and private radiation oncology practices.<sup>16</sup> Although the supply of and demand for professionals fluctuates, experts forecast that the need for cancer care will continue to increase.<sup>12</sup>

Technological innovations create a challenging work environment for radiation therapists and require them to possess increasingly sophisticated skills. Techniques such as intensity-modulated radiation therapy (IMRT), which was introduced only recently, now are used widely. Arguably, it is routine practice for staff radiation therapists to keep up with these advances. However, it also can be said that the skills these complex technologies require deserve accompanying recognition.<sup>17</sup> Continuous advancements also may call for advanced-level practitioners within some cancer centers for strategic planning, peer training and other needs.

RTCPAP member Michelle Hutchings-Medina, M.A., R.T.(T), is a former staff therapist and manager, who now works for a radiation oncology vendor. She also frequently speaks to radiation oncology professionals on staffing and skill development issues. Ms. Hutchings-Medina says that although it may not be clear what advanced practice will look like, the future role of the radiation therapist will be something the industry has never seen before (Michelle Hutchings-Medina, sales manager, IMPAC Medical Systems, St. Louis, Missouri, oral communication, April 6, 2007).

Developing an advanced level of practice for radiation therapists would provide the opportunity for an improved professional level of patient care that is sought by some radiation therapists. The push for specialization is part of an established path for many health professions.<sup>2</sup> In addition, advanced practice would represent an opportunity for occupational advancement currently lacking in the profession, particularly for those wanting to remain involved in clinical care<sup>17</sup> (Stacy L. Anderson, M.S., R.T.(T), CMD, radiation therapy and medical dosimetry program director, University of Oklahoma Health Sciences Center, Oklahoma City, oral communication, April 5, 2007).

### **Defining Advanced Practice**

The idea of advanced practice for health care professionals is not new. Research studies on advanced practice in nursing were prevalent in the 1980s.<sup>18</sup> In U.S. health care and throughout the world, various terms represent advanced practice roles: Physician extender, midlevel provider, expert practitioner, advanced practitioner and specialist are common choices. For the purpose of this discussion, “advanced practice in radiation therapy” will be used to refer to an extended role for radiation therapists in the United States.

Though defining advanced practice specifically belongs to the country, body or initiative seeking to develop a specific professional health care role, the following descriptions provide a basis for discussion and determination of potential roles.

Broadly speaking, advanced practice is characterized by an expanded knowledge base, increased complexity of clinical decision-making and greater skill in managing other health care professionals.<sup>1</sup>

The Ontario Radiation Therapy Advanced Practice (ORTAP) group in Canada defines advanced practice as:

“An advanced practice professional role that requires postdegree/[post]diploma educational preparation in combination with clinical skills acquisition to fulfill the requirements of the job. Elements of the role may be outside the established scope of therapy practice and may overlap current areas of responsibility of another health care professional. These areas of responsibility may, or may not include controlled acts.”<sup>19</sup>

Advanced practice may involve role expansion or role extension. In role expansion, the radiation therapist may develop the current role by taking on additional responsibility. Often, this evolves into a specialist role, such as a radiation therapist who becomes a prostate cancer specialist. In role extension, the radiation therapist takes responsibility for some tasks traditionally performed by other health care professionals. Generally, “advanced practice” serves as the umbrella term for both forms of role development.<sup>2,17</sup>

The crux of the advanced practice role in radiation therapy is the opportunity for an experienced, qualified radiation therapist to fill gaps in service by performing at a more complex, independent level. To do so, the therapist must acquire additional education and proof of competence. The supporting system or employer must supply the appropriate structure and skills mix. The following discussion of U.K. and Canadian initiatives provides several specific definitions of advanced practice.

Advanced practice is not simply a new definition for the evolving, more complex role of every radiation therapist. The advanced role has breadth and depth beyond the responsibilities of today’s therapist and requires additional training and education; this offers an additional career choice for radiation therapists (Kevin L. Rush, M.H.A., R.T.(R)(T), administrative director of the radiation oncology centers, Bloomington Hospital, Bloomington, Indiana, oral communication, April 4, 2007).

An advanced practice role will not be appropriate for every radiation therapist and for every radiation oncology location. If advanced roles develop, the individual therapist and his or her employer must embrace the opportunity based on need and suitable fit.

### **Advanced Practice in the United Kingdom**

A combination of clinical, professional, epidemiological, governmental and educational factors led the United Kingdom to develop an advanced role for radiation therapists<sup>13</sup> (C. Beardmore, February 2007). In 1998 the Prime Minister’s Challenging Cancer Summit led to an increased emphasis on national breast screening. The growth in screening, combined with a significant radiologist shortage, led to development of assistant and advanced roles in diagnostic imaging. The National Health Service (NHS) also collaborated with various stakeholders on plans to better coordinate U.K. cancer care. Groups were formed to address the skill mixes of the cancer work force. At the same time, SOR worked on an educational and professional development strategy to enhance the role of therapy radiographers (ie, radiation therapists) as cancer care was reorganized within the United Kingdom<sup>20</sup> (C. Beardmore, February 2007).

### *Four-tier Skills Model*

These efforts led to the creation of the NHS four-tier skills model. The model was developed to serve as a career progression concept for radiographers and to help support new cancer care approaches. The four-tier model is the basis of advanced practice for U.K. radiographers and therapy radiographers.<sup>20,21</sup> Today, the model also serves as a salary and grading structure and now is known as the “Career Progression Framework” (Angela Eddy, MSc., PgC, D.C.R.(T), senior lecturer, faculty of health and well being,

Sheffield Hallam University, Sheffield, UK, oral communication, February 9, 2007; C. Beardmore, February 2007).

The principles of the career progression framework are to:

- Define multidisciplinary teams not by profession, but by the skills and competencies that best meet the patient's or client's needs.
- Maintain practice standards and develop the inherent potential of all staff involved in radiation therapy services.
- Promote new and extended roles, encourage lifelong learning and offer challenging and rewarding careers.
- Widen the routes of access to clinical careers and improve recruitment and retention of the radiographic work force.<sup>20,22</sup>

The model's levels represent escalating competencies and responsibilities within a multidisciplinary team. Each level is defined accordingly; clinical tasks and activities associated with the team are mapped and competencies are defined for these tasks, irrespective of profession or discipline.<sup>20</sup> The following is a summary of the four-tier model with examples of how the model applies to radiation therapy practice:

**Assistant practitioner:**

An assistant practitioner performs protocol-limited clinical tasks under the direction and supervision of a state-registered practitioner.

**Education:** Vocational and technical standards, some university coursework; eventually may be set at the diploma (similar to an associate degree) level.

**Examples:** Work with the radiation oncology team in support roles and pretreatment areas; may deliver some radiation by working with linear accelerators.

**Practitioner\*:**

A practitioner who autonomously fills a wide-ranging and complex clinical role and is accountable for his or her own actions and for the actions of those he or she directs.

**Education:** Before 1990 radiographers were trained at the diploma level. Beginning in 1990, they were educated at the undergraduate and graduate (ie, bachelor's and master's) level.

**Examples:** Work independently in a number of settings; may supervise and train assistant practitioners, similar to a radiation therapist.

**Advanced practitioner\*:**

An advanced practitioner, autonomous in clinical practice, who defines the scope of practice of others and continuously develops clinical practice within a defined field.

**Education:** Postgraduate study up to and including a master's degree.

**Examples:** Work in a specific clinical area such as pretreatment, breast or lung cancer, lead teams, improve service or see patients following radiation therapy to perform toxicity assessment and management.

**Consultant practitioner\*:**

A consultant practitioner provides clinical leadership within a specialty, bringing strategic direction, innovation and influence through practice, research and education.

**Education:** Evidence of expert practice, master's degree, work toward or completion of a doctoral degree.

**Examples:** Developed in response to service need, such as a consultant therapeutic radiographer specific to gynecology who monitors patients following pelvic radiation to minimize effects on sexual function. The practice has extended to include patients treated for other disease sites.

*\* State registered practitioners are professionals regulated by the various acts and orders that ensure the public have access to and are treated by health professionals who are qualified and competent.<sup>20-22</sup>*

The four-tier model now is embedded in radiographer and therapy radiographer career development pathways.<sup>3</sup>

In 2004 the Department of Health National Radiotherapy Advisory Group formed to assist in solving radiation oncology work force issues in the United Kingdom and to achieve integrated cancer care for all patients. The group conducted a survey to establish benchmarks for radiation therapy staffing. The group also emphasized that staffing decisions must be made locally to meet service requirements, but that the assistant practitioner role likely would exceed 10% of the total staffing at a given location.<sup>23</sup>

Initially, there was some resistance to development of the assistant role in the career progression (four-tier) model, particularly when the professional society's aim was to promote advanced practice. In the case of imaging, the assistant level helped the development of the advanced role. According to Ms. Beardmore, who has been involved in advanced practice in the United Kingdom since 1998, "We thought we could train radiographers up to a higher level [to offer some of the service offered by the radiologists]. But obviously at the lower end, we needed to increase the work force that would take the mammograms so it was thought that because this was a very limited area of practice that we could introduce a new role of assistant practitioner who would work under the direct supervision of the radiographer in a very limited role. ... We thought it would enable us to progress and actually extend the radiographer role." Freeing resources

– or duties performed at the lower skill levels – opens up opportunities for advanced-level practitioners (C. Beardmore, February 2007).

The addition of assistant practitioners working alongside therapy radiographers in the pretreatment area and on linear accelerators at Addenbrooke's Hospital/Cambridge University improved the staffing of linear accelerators and helped the hospital achieve patient waiting time targets. The skills mix also assisted in implementing new treatment techniques and provided career progression opportunities for assistant practitioners and therapy radiographers. The addition of advanced and consultant therapy radiographers improved treatment efficiency, use of radiation oncologist time, the patient experience and enabled career progression for radiation therapy staff.<sup>21</sup> A subsequent U.K. work force study indicated that about 80% of radiation therapy cases involve “routine, protocol-driven” treatment, which appropriately trained and educated therapy radiographers could manage (C. Beardmore, February 2007).

For example, some therapy radiographers now are responsible for breast mark-up (ie, delineating treatment volumes for external beam breast cancer treatment). Previously, radiation oncologists performed this task. Yet in some departments, the radiation oncologists only were available one day per week or for limited sessions, restricting the number of women who could be seen. Waiting lists grew and simulation machines were not used to full capacity. The therapy radiographers performing these tasks are educated at a master's level (A. Eddy, February 2007).

A number of specific advanced practice and consultant therapy radiographer roles have been established. They include the roles of assistants and registered therapy radiographers and involve a higher level of understanding across a broad spectrum of knowledge. Clinical skills assumed by advanced practice therapy radiographers are those previously performed by medical practitioners. The SOR emphasizes that specific duties do not constitute advanced practice so much as an ability to make judgments commensurate with a high level of “freedom to act.”<sup>22</sup>

#### *Role of Other Team Members – Physician Model*

The U.K. cancer care delivery model consists of the NHS and local cancer networks within which cancer services are delivered. These entities are commissioned by primary care trusts.<sup>3</sup> Health care economics in the United Kingdom differ from the U.S. health care system, with few U.K. citizens opting for private medicine. All health care workers – including physicians – are employed by the NHS<sup>24</sup> (A. Eddy, February 2007). Therefore, money is not allocated to professionals (ie, reimbursed) according to which practitioner performs a service (A. Eddy, February 2007).

A new model of care, which is focused on future growth and patient centered, involves case management. The model will require staffing strategies that use all four career progression levels to operate efficiently and cost-effectively. The advanced practice therapy radiographer would provide expert levels of service to patients and ensure well-coordinated continuity of care.<sup>3</sup>

U.K. therapy radiographers may focus on skin care and other tasks that oncology nurses perform in the United States, and some of these patient care responsibilities are being expanded as part of role development (A. Eddy, February 2007; Dawn Fucillo, M.A., R.T.(R)(T)(QM), CMD, director, Samaritan Regional Cancer Center, Corvallis, Ore., oral communication, December 11, 2006). The medical dosimetrist's role in the treatment planning team would be encouraged as part of the skills mix planning.<sup>13</sup>

#### *Evidence for Practice*

As advanced practice in the United Kingdom developed, a great deal of time and thought was given to planning the roles and how best to move the profession along the continuum from practitioner to consultant.<sup>25</sup> Early in the process, it was important to demonstrate to radiation oncologists and peers that therapy radiographers were capable of performing in advanced roles. Overall, the radiation therapy community responded positively to the advanced roles, changing initial perceptions.

Standardizing roles and education while maintaining flexibility were considered critical to the success of the career progression framework. On the one hand, it was important to establish benchmarks and equity as a basis for the education, minimum standards and grades of advanced practice radiographers. Yet because local roles and situations differed, flexibility also had to be maintained (A. Eddy, February 2007; C. Beardmore, February 2007). Educational modules for various roles have been developed and are being incorporated into the master's degree program (A. Eddy, February 2007). Criteria also are being established for the portfolio of competencies of advanced practice candidates. Acceptance of the roles by therapy radiographers, radiation oncologists, the NHS and other professions has been largely positive (C. Beardmore, February 2007).

#### **Advanced Practice in Canada**

As interest in advanced practice grew in Canada, radiation therapists began to work in advanced roles informally, with no established criteria to define positions and no supporting educational framework.<sup>17</sup> In 2004 the ORTAP group, which consisted of radiation therapists, managers and educators, received funding from the Ministry of Health and Long Term Care to field test advanced practice roles in Ontario. The Canadian Association of Medical Radiation Technologists (CAMRT) also joined the pilot project, which is known as AP4RT.<sup>26</sup>

A project oversight committee received 21 proposals and selected five roles to pilot test for one year:

- Skin cancer advanced practice therapist. At Toronto-Sunnybrook Regional Cancer Center, the design for an expanded radiation therapist role calls for coordinating and evaluating the skin cancer program, performing patient triage and enhancing treatment planning competence. The goal focuses on decreasing patient wait time and enhancing continuity of care and access to services.
- Planning image definition and contouring specialist. Princess Margaret Hospital has been testing an advanced practice therapist role designed to increase contouring

accuracy and consistency. The therapist performs complex planning, plays a key role in establishing related protocols and coaches other professionals.

- Patient assessment and system management review therapist. At Toronto-Sunnybrook Regional Medical Center, this advanced practice radiation therapist is responsible for performing triage on a high volume of patients to better manage treatment reactions. The goal is to ensure that patients who need additional care have time with radiation oncologists and nurses and that those who don't need care still receive regular attention and assessment.
- Mycosis fungoides radiation therapist. Hamilton Regional Cancer Center's pilot role is designed to enhance overall coordination within an existing mycosis fungoides care program. The advanced practice radiation therapist serves as the liaison with other members of the multidisciplinary team to provide seamless care. The therapist is involved in all aspects of care, from patient assessment to patient education concerning toxicities to prescribing radiation dose, weekly review and follow-up care.
- Palliative care advanced practice radiation therapist. Three sites (Kingston Regional Cancer Centre, Princess Margaret Hospital and Toronto-Sunnybrook Reional Cancer Centre) submitted similar proposals for advanced practice radiation therapists specializing in palliative care. Project reviewers asked the sites to collaborate to develop two positions. The goals of this advanced practice position are to reduce travel requirements and wait times for palliative care patients; increase access to palliative radiation therapy; provide comprehensive, independent and consultative assessment, referral and treatment for patients; and provide more seamless care.<sup>27</sup>

In May 2006 HealthForceOntario announced the investment of nearly Can\$45 million in a strategy designed to ensure a health care professional skills mix to meet future needs. The strategy included creation of four new roles: physician assistant, nurse endoscopist, surgical first assist and clinical specialist radiation therapist.<sup>28</sup> The clinical specialist radiation therapist position is defined as "medical radiation technologists (radiation therapists) with additional training to provide more specialized care. They will work with the radiation oncologists, nurses and medical physicists to ensure safe and optimal patient outcomes."<sup>29</sup>

The province of Ontario accepts the bachelor's degree as its minimum requirement for radiation therapists, but entry to practice does not require a baccalaureate in the rest of the country<sup>17</sup> (A. Bolderston, February 2007).

#### *Health Delivery and Work Force*

Although the Canadian economic model for health care differs from the U.S. model, payment for some patient care duties can be an issue (A. Bolderston, February 2007). Canada's health care is provided and paid for under a single-payer system.<sup>30</sup> The use of nurses has evolved so that specialty oncology nurses may perform patient review and clinic duties, particularly in larger cancer centers (A. Bolderston, February 2007). Some

of the duties that would fall under new advanced practice roles, such as patient assessments and reviews during treatment, already are performed informally in Ontario.<sup>31</sup>

Ontario appears to be leading the way in advanced practice for Canadian therapists; however, CAMRT also is discussing a possible advanced practice role. Similar to a nurse practitioner, the MRT practitioner or extended class medical radiation technologist would work more independently and may work in remote areas. The society has an advanced certification program that mixes self-directed education and course work.<sup>32</sup>

### *Current and Future Picture*

A study conducted by Bolderston<sup>17</sup> found general agreement among radiation therapists, managers and educators concerning advanced roles in Ontario. The study uncovered a great deal of variability in advanced practice role delineation in Canada, and Bolderston recommends development of provincial and national frameworks for advanced practice roles<sup>17</sup> (A. Bolderston, February 2007). She also recommended review of fee structures and responsibilities for advanced practitioners to overcome potential barriers caused by reimbursement and physician revenue issues. A final recommendation involved overcoming radiation therapists' insecurity with respect to the new roles.<sup>17</sup>

Nicole Harnett, M.Ed., M.R.T.(T), ACT, project manager for the AP4RT initiative, said that the ORTAP group is not advocating any specific advanced practice role, but has created a profile encompassing all of the various competencies expected from advanced practice radiation therapists. Results of the AP4RT pilot studies were submitted to the Ministry of Health in December 2006, which approved funding for a clinical specialist radiation therapist. The AP4RT staff plans to publish the projects' results and plan<sup>33</sup> (Nicole Harnett, M.Ed., M.R.T.(T), ACT, director, masters in medical radiation sciences program, University of Toronto, Toronto, written communication, February 19, 2007). Satisfaction surveys and interviews have shown that overall, the roles were very well received by all stakeholders (N. Harnett, February 2007).

### **The Midlevel Practitioner Trend**

Effectively managing resources remains a challenge in all health care specialties; creating the most efficient skills mix for a given local service or provider may call for the use of physician extenders.<sup>7</sup> The term "skills mix" usually describes the combination of positions, grades and occupations in a given organization. It also may refer to the combination of activities, experience and competencies needed for each job within the organization.

Skills mix is particularly important in health care organizations where cost containment, reform and an emphasis on quality constantly affect strategy and staffing. Shortages occur in various professions, and technological innovation or the development of new medical interventions requires retraining staff or introducing a different mix of staff. Outside factors such as new public health initiatives and changes in the legislative and regulatory environment also can affect staff roles or introduce new types of workers.<sup>34</sup>

A series of reports by the Pew Health Professions Commission studied the training of health professionals in relation to the changing needs of the health care system. The first report, published in 1991, stated that “the education and training of health professionals is out of step with the evolving needs of the American people.”<sup>1</sup> The commission released its fourth and final report in 1998, listing a series of recommendations to help bring the work force into step with the technology and demands of health care. Among these recommendations was a strong emphasis on advanced practice nursing and “other nonphysician providers in clinical settings.” The commission listed four challenges that formed the core of its purpose throughout 10 years of existence, including:

“First, the nature of health care work is being reconsidered. As health systems struggle to reach new thresholds of lower costs and higher quality, the health care workplace is demanding new professional skills and new configurations of staff including, in some cases, reductions in the numbers of practitioners needed. This will be an involved and creative undertaking that will tax the traditional mindset of the professional. As the system pushes for outcomes at the level of populations and large health care organizations, the professional community must develop the capacity to contribute meaningfully or run the risk of losing their autonomy and influence.”<sup>1</sup>

The use of physician extenders (also called midlevel practitioners or nonphysician providers) has depended somewhat on shortages of physicians and other medical professionals. Restrictions on medical resident duty hours in 2003 may have fueled the resurgence of interest in physician extenders.<sup>6,7</sup> The Pew Commission reports were among many that promoted advanced roles for nurses and a degree of standardization for the roles.<sup>1</sup>

#### *Advanced Practice Nurses*

The benefits to patients of advanced nursing practice have been documented, as have some financial benefits.<sup>18</sup> Four distinct advanced specialties have been defined for nurses: nurse midwife, certified registered nurse anesthetist, clinical nurse specialist and nurse practitioner. The American Nurses Association (ANA) reports that more than 240,000 advanced practice registered nurses currently work in the United States. Their scope of practice varies widely among the states.

Most of the more than 141,000 nurse practitioners practice independently. More than 60% have a master’s degree and an additional 10% have a postmaster’s certificate. Clinical nurse specialists normally receive formal clinical preparation that results in a master’s degree. Certified registered nurse anesthetists are educated at the master’s level or through a post-RN certificate program. Slightly more than one-half of certified nurse midwives are master’s prepared and an additional 5% receive a postmaster’s certificate. The ANA states that:

“Some 60% to 80% of primary and preventive care traditionally done by doctors can be done by a nurse for less money. This is not to say that

nurses work cheaper, but their cost-effectiveness reflects a variety of factors related to the employment setting, liability insurance and the cost of education.

With an emphasis on health promotion and disease prevention and a proven record of providing excellent primary care in diverse settings, advanced practice nurses form a critical link in the solution to America's health care crisis. Removing barriers to advanced practice nursing would pay a healthy dividend now and in the future.”<sup>35</sup>

In the United Kingdom, the NHS is replacing physicians with nurses and other practitioners to perform many frontline tasks and procedures. New nurse consultant and community matron roles are developing, which are supported by teams of nurse practitioners or clinical nurse specialists, as well as staff nurses and support workers. Most advanced practice nurses are master's prepared, but many have acquired training through a combination of academic and clinical credit. As of 2005 the chief nurse of England was leading a national dialogue on postregistration and competence to practice.<sup>36</sup>

#### *Sonographers and Nuclear Medicine Technologists*

Allied health professions now are embracing the idea of advanced practice,<sup>18</sup> but occupations other than nursing receive relatively little attention in the literature.<sup>34</sup> In 2003 Benacerraf et al<sup>37</sup> described the successful use of an advanced practice sonographer in an obstetric and gynecologic ultrasound practice in Boston. The advanced practice role evolved during the more than 20 years the sonographer had worked in the practice. The report states that “The presence of our advanced practice sonographer has enabled us to function as though we had one more physician than we actually have. An additional advantage of having an advanced practice sonographer is the flexibility it provides to the workings of the practice.”<sup>37</sup>

In addition to the advanced practice sonographer described by Benacerraf, another physician practice has worked with a “sonographer practitioner” since the 1980s to assist in the management of ultrasound examinations. The Society of Diagnostic Medical Sonography has established criteria to define a position called advanced practice sonographer.<sup>38</sup> Bude et al<sup>38</sup> reported on the successful training of two experienced sonographers to triage and dictate ultrasound cases.

A study conducted in 2000 showed a high level of interest in an advanced practice career pathway for nuclear medicine technologists. Nuclear medicine technologists indicated that they were performing tasks outside their scope of practice without the benefit of formal training. The SNM Technologist Section then conducted a physician survey to assess how a midlevel provider in nuclear medicine might function and how physicians would respond to the position. The results revealed a positive response overall to development of an advanced practice role in the specialty.<sup>39</sup>

SNM has formed a task force to develop and implement an educational and credentialing pathway for advanced practice nuclear medicine technologists. The society's professional

education and development fund offered grants to two institutions to develop a new master's degree program for imaging specialists in nuclear medicine.<sup>40</sup>

#### *Radiologist Assistant*

The United States followed the lead of the United Kingdom by developing an advanced practice role for radiographers. The radiologist assistant (RA) role was defined during a consensus conference in 2002 by representatives from the ASRT, the American College of Radiology, the American Registry of Radiologic Technologists (ARRT), state agencies that license radiologic technologists and members of the radiologic science educational community. As a result of the conference, a curriculum was developed and grants were awarded to four universities to develop educational programs in 2002-2003.<sup>8</sup> In 2005 the first class of RAs graduated, and the RA certification program became operational.<sup>8,41</sup> In January 2006 the ARRT reported that it was exploring the possible development of other physician-extender certification programs.<sup>41</sup>

RAs take leading roles in patient management and assessment. The RA performs selected radiology examinations and procedures under the supervision of a radiologist, with the level of supervision dependent on the type of examination. The RA also may evaluate image quality and make initial observations, then forward these observations to the supervising radiologist. RAs are educated at the bachelor's level or higher.<sup>42</sup>

#### *Advanced Practice in Oncology*

In the United States some examples of advanced practice activity can be found within radiation oncology. The ANA and Oncology Nursing Society has defined roles for oncology nursing practice that include the clinical nurse specialist, educator, researcher and administrator. Of these, the clinical nurse specialist is the closest model to an advanced radiation therapist role. The clinical nurse specialist prescribes medications, performs physical examinations, offers psychosocial support and provides patient education. Advanced practice nurses in oncology have a minimum of a master's degree.<sup>2</sup>

As physicians have taken on a more strategic role in medical oncology, nurses are playing a greater role in chemotherapy delivery.<sup>13</sup> The oncology physician assistant (PA) model also has developed, although some radiation therapy leaders believe that radiation therapy treatment should continue to be provided by radiation therapists – at the appropriate practice level – rather than by another physician extender specialty (Radiation Therapy Clinical Practice Advisory Panel, meeting minutes, April 2003).

A recent ASCO survey reported that 54% of oncologists work with nurse practitioners or physician assistants, and that on average, these practices have higher weekly visit rates than practices not using midlevel providers. Use of nurse practitioners and physician assistants may improve practice efficiency.<sup>12</sup>

There are isolated cases of radiation therapy graduates who also have PA training. One such individual works in a practice with other PAs who do not have a radiation therapy background. When asked to compare radiation therapist-prepared midlevel practitioners with those who had general PA preparation, physicians in the group expressed a

preference for the individual with a radiation therapy background. “They much preferred someone to have the radiation therapy background. It just makes them more versatile. If the physician was busy with a consult, she was able to start a simulation procedure and the physicians could oversee it at the end and make modifications if necessary; they saw this as a great advantage,” according to Ms. Anderson (S. Anderson, April 2007).

In 2001 Michelle Hutchings-Medina witnessed an increased use of PAs in radiation oncology at the Johns Hopkins Hospital in Baltimore. The practice resulted from a reduction in use of residents across the country. Although Ms. Hutchings-Medina does not know the current status of PAs in radiation oncology at the hospital, she said her initial observation was that “PAs had no desire to sit at a treatment planning computer and contour structures.” Ms. Hutchings-Medina recognizes that PAs and nurse practitioners are used in radiation oncology, but she believes they need clearly identified roles (M. Hutchings-Medina, April 2007).

An ASCO report on the supply of and demand for medical oncologists states that the number of nurse practitioners and PAs will not be sufficient to bridge the gap between physician supply and demand in the specialty projected through 2020. Reasons cited were questions whether growth in the two midlevel professions could be sustained and competition with other specialties serving the elderly for nurse practitioners and PAs.<sup>12</sup>

The University of Texas M.D. Anderson Cancer Center in Houston has identified a professional development model consisting of an upper-level skill set for radiation therapists, nurses and medical dosimetrists. “We identified skill sets that are inclusive of demonstrative leadership, broadband knowledge base of treatment delivery skills and patient assessment in which radiation therapists have the opportunity to show proficiency. Then they can be recognized for that different level,” said Charles Washington, M.B.A., R.T.(T), FASRT, director of clinical services and operations, division of radiation oncology, M.D. Anderson Cancer Center (C. Washington, oral communication, February 21, 2007). The model evolved from the need for a professional development ladder for a staff of 70-plus radiation therapists.

A combination of factors calls for an exploration of advanced practice in radiation therapy. Current environmental forces include:

- Increased acceptance and use of midlevel providers in all specialties, including oncology.
- A movement within several health care specialties to create advanced practice roles.
- The increased complexity of radiation oncology practice.
- Uncertain economics in health care that demand cost-effective care delivery.
- An aging population in need of more and better coordinated cancer care.

Finally, there is a need for a creative and collaborative approach that will meet the needs of employers and radiation therapy professionals in settings from large, advanced facilities such as M.D. Anderson to small rural cancer centers.

### **ASRT Efforts**

At the initial RTCPAP meeting in April 2003, the nine radiation therapy professionals forming the panel discussed how practice had changed in the previous five years and how it might change in the future. The panel identified areas of further research, including advanced practice (Radiation Therapy Clinical Practice Advisory Panel, meeting minutes, April 2003). Mark Ponto, B.A., R.T.(R)(N)(T), CMD, manager of the cancer treatment center for Covenant Medical Center in Waterloo, Iowa, described the panel meetings: "We had a lot of discussion and it was a good cross-cut of different staff from different facilities. We had representation from smaller facilities, from facilities like mine, and from larger facilities. We had staff therapists, managers, educators and directors" (M. Ponto, oral communication, April 5, 2007).

On September 13, 2004, RTCPAP met to discuss advanced practice, including similar movements in other professions, potential roles for advanced practice in radiation therapy, potential barriers to advanced practice, education for an advanced role and the potential need for such a role (Radiation Therapy Clinical Practice Advisory Panel, meeting minutes, September 2004).

RTCPAP members also conducted focus groups on advanced practice throughout 2004; the ASRT compiled the results in April 2005. Focus group participants were primarily radiation therapists, but also included medical dosimetrists and a radiation oncologist. The median time participants had been working in radiation oncology was 14 years. Focus group responses served as the basis for future survey design, validated RTCPAP discussions and triggered discussion concerning possible advanced practice roles for radiation therapists.<sup>4</sup>

### **Defining Roles**

How cancer services are provided at the local level and specific patient needs may shape the role of the advanced practitioner.<sup>25</sup> Current advanced practice roles in Canada and the United Kingdom vary from clinical specialist positions focused on specific cancer sites to radiation therapists who coordinate palliative care services for patients.<sup>43,44</sup> Common characteristics of advanced practice include responsibility outside the established scope of practice, an extended education and increased preparation.

To best meet the needs of cancer care in the United States and to work within the framework of the U.S. health care system, three primary radiation therapy advanced practice roles have been suggested: continuity of care specialist, technology-education specialist and physician extender.

#### *Continuity of Care Specialist*

Continuity of care is critical in radiation therapy to ensure that set-up parameters match the treatment plan throughout treatment planning and delivery. Continuity of care also has become increasingly important on a broader level. A report from the U.K. Department of Health emphasized the need for “more patient-centered, holistic care across the radiation therapy service.”<sup>3</sup> The NHS has focused on using multidisciplinary teams to deliver more focused care. In addition to government initiatives, there has been a drive to maximize the talents and skills of the existing work force by facilitating work across traditional professional boundaries.<sup>18</sup> Studying the patient pathway for common cancers helped determine where health care professionals came into contact with patients and where each health care professional might best intervene (A. Eddy, February 2007).

In Canada, the AP4RT pilot project job descriptions for advanced practice palliative care radiation therapists include:

- Providing streamlined palliative consultations.
- Delivering education and counseling to patients and families.
- Coordinating appointments to minimize waiting.
- Ensuring the availability of all information required to complete a patient’s plan.
- Evaluating radiation therapy efficacy and follow-up after treatment.
- Coordinating care with other health care professionals.
- Assisting patients in accessing end-of-life and hospice care through community services.<sup>43</sup>

In the rapid response palliative clinic, the advanced practice radiation therapist performs the initial consultation, the treatment planning and simulation, the prescribing and the follow-up. Rather than the patient bouncing from nurse to physician to radiation therapist, there is a continuity of care where care once was fragmented (N. Harnett, February 2007).

In a 2000 report on improving provider skills, the World Health Organization included comprehensiveness, appropriateness and continuity in its definition of quality health care.<sup>45</sup> Stephanie L. Eatmon, Ed.D., R.T.(R)(T), FASRT, program director in the health science/radiation therapy department at California State University Long Beach, proposes a patient care role for advanced practice. She envisions a radiation therapist who would be assigned to the patient or to the physician and who would have a group of patients: “They would follow the patient from initial consult all the way through their treatment. I really love this role especially because with increasing technology I think it’s easy to lose the patients and the patient care aspect” (S. Eatmon, oral communication, April 9, 2007).

A 2005 Institute of Medicine report “From Cancer Patient to Cancer Survivor: Lost in Transition” stated that cancer patients’ knowledge about their diagnoses and treatments varies widely. The authors recommended recognizing cancer survivorship as a distinct

phase of cancer care. As part of their care, cancer survivors should receive formal, written plans that include summaries of their diagnoses and primary treatments received. They also should receive a follow-up care plan that includes information on the expected course of recovery, treatment toxicities, ongoing health maintenance and surveillance strategies. Cancer care providers currently are determining how best to meet the needs of a growing number of cancer survivors and to eliminate gaps in care following primary treatment.<sup>46,47</sup>

#### *Technology-education Specialist*

Technology and education specialists could help coordinate in-house applications training and the introduction of new technology for other radiation therapists. Radiation therapists surveyed in Canada and the United States cited advanced technologies as themes, drivers or potential roles for advanced practice radiation therapists.<sup>4,17</sup>

A recent ASRT report outlined the need for a strategy to improve new skills acquisition by radiologic technologists. Among the factors driving the need is disruptive innovation.<sup>48</sup> This phenomenon occurs when a relatively inexpensive new technology is introduced. At first, the technology addresses some of the low-end applications of an industry and poses no apparent threat to older established technologies, which are continually refined to meet the needs of high-end users. As the new technology grows in sophistication and applicability, however, it seizes most of the ground formerly held by the old technologies, relegating them to specialized use.<sup>49</sup>

A classic example of a disruptive innovation was personal computers supplanting mainframe computers. IMRT once was a new technology, provided only in the largest and most advanced cancer centers, yet now it is a widely accepted treatment in various settings.<sup>48</sup>

When RTCPAP members asked focus groups how their jobs had changed in the past five years, 67% of participants cited new equipment or technology.<sup>4</sup> A report of focus group results recommended educating appropriate users and trainers. A “super user” could educate other radiation therapists about new technologies and might be preferred to a department supervisor, who may perform little to no patient care.<sup>48</sup>

Research has shown that although hospital executives rank adopting new technology high on their list of priorities, time may not be allocated to train staff.<sup>50</sup> A survey of radiologic technologists has reported that they often rely on other technologists to remain up-to-date in their specialty.<sup>51</sup> Advanced practice focus group participants felt that technology education and new technical skills were important new roles for radiation therapy professionals.<sup>4</sup>

In certain settings, designating an advanced practice radiation therapist to teach others about the latest technological advancements would expand the R.T.’s role by dedicating an experienced and educated staff member to the responsibility of keeping up with the latest technology. The technology-education specialist also would ensure that education of other radiation therapists in new technologies is maintained at the appropriate level.

### *Physician Extender*

The most common advanced practice role in many specialties is physician extender. In a 2003 Ontario study, radiation therapists were asked what roles they would consider advanced. Among the traditional physician activities listed were:

- Patient review during treatment (currently conducted with a radiation oncologist in some Ontario centers).
- Patient assessment, including taking medical histories.
- Therapist-only simulation, which currently occurs to varying degrees in Ontario. The physician still signs the subsequent simulation films and is responsible for the initial prescription.
- Contouring critical structures and performing dosimetry more autonomously, with the physician responsible for signing off on the resulting plan or isodose distribution.
- Catheterization during simulation (a controlled act in Ontario).
- Administering contrast media during simulation (also a controlled act).
- Check (port) film sign-off, with the physician signing off on the films early in the treatment. Many studies are investigating whether the physician's approval can be delayed or eliminated.<sup>31</sup>

Job descriptions from the AP4RT project included clinical practice tasks that fall under the physician extender model, such as performing complex treatment planning, treatment mark-up, patient triage and assessment, prescription from a limited formulary, radiation dose prescription and pretreatment medication organization.<sup>43</sup>

In the United Kingdom, the specifics of advanced practice roles for radiation therapists also are being refined. In general, consultant practitioner roles emphasize responsibility for patient care and freedom to act. Advanced practitioners receive and offer clinical supervision and act as preceptors. According to the College of Radiographers guidance document for managers, "It is not the nature of the 'specialism' that indicates that the individual is an advanced practitioner but, in particular, their ability to make judgments commensurate with a high level of 'freedom to act.'"<sup>22</sup>

For some time, certain therapy radiographers in the United Kingdom have evaluated port films and performed weekly patient reviews, tasks formerly handled by physicians. Therapy radiographers also are assuming the task of delineating volumes for breast cancer external beam therapy, as in the example provided above (A. Eddy, February 2007).

The continuity of care specialist focuses on the patient; Mr. Rush sees the physician extender role as an opportunity to focus on the technical aspects of radiation oncology, stating "The physician spends a lot of time contouring, looking at things. This person

could do those sorts of tasks, with final approval from the physician" (K. Rush, April 2007).

#### *Other Potential Roles*

Other advanced practice role may be molded from the above designations. For example, Ms. Hutchings-Medina would like to see an advanced practice imaging processing specialist in radiation therapy. Although this role could fall under a physician extender or technology-education specialist designation, the emphasis of the role would be on use of imaging in radiation oncology.

Ms. Hutchings-Medina said the need for imaging expertise specific to radiation therapy has grown markedly in recent years with the use of magnetic resonance (MR) and positron emission tomography (PET)-computed tomography (CT) and PET-CT simulation methods, as well as others. "We can't just say let's get credentialed people or take therapists and get them credentialed in MR and CT and all of these other modalities. I think the opportunity is creating programs that look at all of these different imaging modalities and how they're utilized in radiation therapy," she said (M. Hutchings-Medina, April 2007).

Individual facilities may want advanced practice therapists with specialized treatment, simulation or 3-D reconstruction skills.

#### **Education and Preparation**

Education and skills articulation for advanced practice radiation therapists must be determined as roles are clearly defined. A master's degree appears to be the most appropriate base for education of advanced practice radiation therapists.

In the United States, education for midlevel practitioners, including nurses, generally occurs at the postbaccalaureate level.<sup>36</sup> The SNM Technologist Section Advanced Practice Task Force recommends that advanced practice nuclear medicine technologists be educated at the master's degree level, most likely after several years of experience.<sup>39</sup>

In the past decade, U.K. radiography education and practice have undergone numerous changes. The education foundation has moved from hospital-based radiography schools, in which entry to the profession and state registration involved a diploma from the College of Radiographers, to higher education institutions (HEIs) offering degree-level qualifications. State registration is based on a bachelor's of science degree with honors but, recently, opportunities have opened for master's-level study. According to the College of Radiographers:

"The capacity of diagnostic and therapeutic services has been increased by the introduction of new technologies with an ever-increasing demand placed upon them. In response to these demands, skill mix and emergent new and expanded roles have been introduced. During the last 10 years, the College of Radiographers has accredited intravenous injection courses in eleven HEIs, and it is now commonplace, for example, for

radiographers to undertake gastrointestinal studies, once the domain of the radiologist. From image reporting to angiography, from radiotherapy planning to review clinics, radiographers are making major contributions to health care and patient management. There are many more opportunities for radiographers to undertake research, involve themselves in education and to attain senior management positions.”<sup>52</sup>

Modules have been designed to help educate therapy radiographers in the United Kingdom. In September 2007 these modules will be incorporated into a master’s degree program (A. Eddy, February 2007). Portfolios document assessment of skills and progression<sup>53</sup> (C. Beardmore, February 2007). The College of Radiographers has recommended that the master’s of science degree is an appropriate educational level for advanced practice therapy radiographers and that consultant level radiographers should be educated to the doctoral level or equivalent.<sup>18</sup> The next step is to ensure funding for postgraduate education and training (C. Beardmore, February 2007).

Canada, like the United States, does not require the bachelor’s degree for entry to the profession, except in Ontario. The AP4RT pilot project positions required a minimum of a bachelor’s degree, a master’s degree or work toward a master’s degree. They generally also required a minimum of five years of experience as a radiation therapist.<sup>43</sup>

Studies have shown improved critical-thinking skills among master’s-level prepared nurses.<sup>54</sup> Critical thinking will be an integral part of advanced practice in radiation therapy. “The U.K. and Canadian models show that therapists have the wherewithal, both from a technical perspective, and from a critical-thinking skills perspective, to do the job,” said Mr. Rush (K. Rush, April 2007).

### **Potential Barriers and Lessons Learned**

There are always barriers to change and the introduction of new roles, at least early in the process. The radiation therapy community in the United States can learn from colleagues in other countries and adapt these lessons to the unique environment of the U.S. health care system and free market approach to employment.

#### *Standardization*

If training and scope of practice are not standardized to some extent, advanced practice radiation therapists cannot easily move from one institution to another and roles within organizations may overlap. In the United Kingdom and Canada, striking a balance between standardized advanced practice roles and local flexibility has remained an ongoing challenge. Efforts have been underway to develop educational models, and compensation now is linked to skills and attributes rather than seniority (A. Eddy, February 2007).

In the case of the United Kingdom, Ms. Beardmore says that “Flexibility is important but level of practice needs to be equitable. These roles need to reflect local need and they need to work through what your local service looks like and what you want it to look like” (C. Beardmore, February 2007). In Canada regional and national roles still are in

development and research stages. Ms. Bolderston admits that setting competencies and assigning responsibilities (e.g., who signs off) across provinces and the nation will be a tough task. (A. Bolderston, February 2007).

The key to standardization in the United States will be setting role delineations that clearly define advanced practice, while also allowing for flexibility in cancer care settings.

#### *Territoriality Among Professions*

One of the biggest challenges for those considering advanced practice is the issue of territoriality. Extending the role of one profession can infringe on the practice boundaries of another profession. The push for professionalism can lead to turf battles and inefficient use of personnel.<sup>2</sup> However, if roles are designed appropriately, many concerns about territoriality can be overcome. Allowing for local flexibility in advanced practice roles, while also keeping within a newly established scope of practice, can help overcome some concerns. In the United Kingdom, trials and research helped lead to the career progression model. The trials involved multiple sites and multidisciplinary representatives. According to a Department of Health report, “The exact nature of the emerging new roles would be determined by the skills and competencies required of the whole clinical team.”<sup>20</sup>

Many territorial feelings result from a lack of understanding, collaboration and input.<sup>55</sup> According to Ms. Bolderston, there are pros and cons to the approaches taken in Canada and the United Kingdom. She said the grass-roots approach in Canada meant early involvement of all professions affected by radiation therapist advanced practice roles. “People don’t like to feel that their toes are being stepped on. But I found we were more frightened of [the idea of] territoriality than [what] actually existed. We did a lot of education outreach when we started the project because we wanted the departments to get on board and understand what we were doing. So we visited the departments in Ontario and had brief education sessions with questions and answers. … You read a lot of the literature and think you’re going to hit a brick wall but it wasn’t that bad” (A. Bolderston, February 2007).

A job description that clearly delineates the role, telling why a midlevel practitioner was hired and that sets performance expectations and measurements can help decrease local turf issues with other staff members.<sup>7</sup> On a broader scale, a consensus concerning scope of practice boundaries that defines responsibilities where the task boundaries begin to blur can help minimize the protectiveness people may feel (C. Washington, February 2007).

Positive survey responses concerning an advanced practice nuclear medicine technologist<sup>39</sup> and the cooperative response to the radiologist assistant position in the United States are positive signs concerning physician acceptance of an advanced practice radiation therapist role. The entire radiation therapy community (ie, radiation therapists, educators and related professionals and organizations) will need to be involved in further study of the issues.

### *Delineating Between Expert Practice and Advanced Practice*

The concept of advanced practice moves beyond the typical radiation therapy scope of practice – it is a new role with a new set of responsibilities and preparation. In other countries and potentially in the United States, advanced practice may be confused with expert practice.

The term “expert” is vague and ill defined. Eddy cites work by Benner articulating how practitioners move through five key stages of professional development: novice, advanced beginner, competent, proficient and expert. By the time practitioners reach the expert level, they no longer rely on analytical principles or guidelines to connect their understanding to a situation or the appropriate action to take.<sup>18</sup> Arguably, this is an essential skill for a radiation therapist who will practice at the advanced level, but possessing this skill alone – having made the progression from novice to expert – does not automatically place a professional in an advanced practice role. Clear benchmarks of performance and education, as well as role clarification and performance will determine the difference.<sup>18</sup>

In contrast to the definition of advanced practice above, Ontario’s AP4RT project defines an expert practitioner as:

“The progression or growth of the radiation therapy role from that of entry-level (that are required from registration in the profession), falling within the boundaries of the education, theory and practice of the original scope of practice. This growth results from the strengthening of skills through continuous learning, training and on-the-job experience that accompanies increasing levels of mastery of therapy practice and continuous professional evolution.”<sup>19</sup>

### *Shortage Concerns*

In the RTCPAP focus groups, several participants expressed concerns about a shortage of radiation therapists and the possibility that creation of an advanced practice role would add to the shortage.<sup>4</sup> The focus groups were conducted in 2004-2005 and perceptions of radiation therapist staffing shortages may have been based more on recent events than the emerging reality. A 2005 radiation therapy staffing survey reported that recruiting for radiation therapists had become substantially less difficult than it had been in the previous year.<sup>56</sup> The 2006 ASRT Enrollment Snapshot study combined data from radiation therapy program enrollment, the ARRT and the Bureau of Labor Statistics to project a surplus of about 25% in the radiation therapist labor pool by 2014.<sup>57</sup>

The advanced role leads to possibilities for a new enriched job position, offering increased autonomy, task significance and identity and use of a wider range of skills than a radiation therapist may exercise in a staff position.

As for concerns about shortages, not all employees pursue enriched jobs when they have the choice; some prefer to remain in their current positions and career tracks.<sup>2</sup> In the

United Kingdom, advanced practice roles also are viewed as helping increase long-term retention in the field (A. Eddy, February 2007).

### **Benefits of Advanced Practice**

Many benefits of an advanced practice role for radiation therapists have been outlined above. In addition to being better poised to meet the demands of population, innovation and technology, two benefits stand out: opportunities for personal and professional development and improved patient care.

#### *Personal and Professional Development*

Job model research has shown that a job needs to do more than supply a salary – it needs to supply the opportunity for personal growth and self-esteem. Skill variety, significance of tasks and autonomy are core dimensions identified in job enrichment.<sup>2</sup> Historically, retention of sonographers has been difficult, with management as the only choice for advancement. Creating an advanced role creates a pathway for job advancement and professional development that may improve retention.<sup>38</sup>

At Addenbrookes Hospital in Cambridge, superintendent radiographer Jane Head said the staff followed the four-tier structure in developing their advanced practitioner role: “We have since used it successfully to improve the efficiency of our patient pathway as well as our career progression route” (Jane Head, written communication, February 22, 2007).

The professional development model at M.D. Anderson has provided a new level of autonomy and job satisfaction for radiation therapists (Sandra Hayden, B.S., R.T.(T), administrative director of radiation oncology services, University of Texas M.D. Anderson Cancer Center department of radiation oncology, oral communication, February 21, 2007).

The decision to pursue an advanced practice education and role is a personal choice. Although a given individual may not have the desire to go back to school, the radiation therapist community likely will support the advanced practice role and education component if individual therapists think less about their own role protection and more about “the future of this profession for generations to come. It’s not about me; it’s about the profession and the need outside of the clinic where I work,” said Ms. Hutchings-Medina (M. Hutchings-Medina, April 2007).

#### *Improved Patient Care*

As demonstrated by driving factors and roles outlined above, providers stand to benefit from the most effective and efficient skills work force mix when appropriately planned. Primarily, patients benefit from improved care. Though outcome data are pending, the Canadian pilot projects have noted examples of improved patient compliance and improved patient satisfaction (N. Harnett, February 2007).

In the United Kingdom, the emphasis on patient-centered care has driven role redesign in the four-tiered career progression framework. To facilitate self-management of their

cancer, patients require timely and appropriate guidance and support. An advanced practice radiation therapist could coordinate care across the radiation therapy pathway, managing the entire process.<sup>3</sup>

In her continuing education research on new technologies, Dr. Eatmon has been impressed with innovative technology, but she foresees a future in which radiation therapists and other staff concentrate on computer screens, leaving patients on the treatment table while the caregivers manipulate data. “Without the patient connection, we lose so much. I would love to see a job where a radiation therapist could oversee a group of patients and follow them through therapy along with a physician. That’s a dream job,” she said (S. Eatmon, April 2007).

## **Conclusion**

Exploring advanced practice roles for radiation therapists requires an open dialogue among the members and leaders of organizations, educators, managers, radiation oncologists and other representatives of professions who have a stake in role development and improved cancer care.

Collecting information and data can help produce evidence-based role delineation. (N. Harnett, February 2007). These efforts may require substantial time investment, but informed dialogue and careful planning could lead to improved cancer center efficiency, a new professional development option for radiation therapists and improved patient satisfaction and care.

In the United Kingdom, initial concerns about advanced practice evolved into acceptance, enthusiasm and a desire to see the system implemented widely.<sup>20</sup> In Ontario initial concerns about legal issues and scope of practice boundaries gave way to a greater excitement and enthusiasm, and a sense that barriers to advanced practice were not insurmountable.<sup>17</sup> RTCPAP members know there will be barriers, that work remains and that more information must be gathered. Radiation oncologist input will be essential, along with the input already gathered (K. Rush, April 2007).

Advanced practice can release the potential of professionals who are best poised to know what cancer patients want and to help them navigate the cancer care experience.<sup>25,58</sup> An unwillingness to take the next steps and move away from a current comfort zone could leave the radiation therapy profession lagging behind a movement toward improved continuity of care for cancer patients, an undeniable wave of technological development, a national trend in use of physician extenders and an essential emphasis on high-quality cancer care.

*Members of the Radiation Therapy Clinical Practice Advisory Panel include Stacey Anderson, Shaun Caldwell, Stephanie Eatmon, Dawn Fucillo, Joanne Greathouse, Michelle Hutchings-Medina, Sal Martino, Mark Ponto, Jerry Reid, Kevin Rush, Charles Washington and Anne Marie Vann.*

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