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Development of a Professional Practice Model for Neuro-oncology Advanced Practitioners at an Academic Medical Center: A Quality Improvement Project

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Authors' disclosures of conflicts of interest are found at the end of this article.

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Abstract

In medicine, neuro-oncology practice falls outside the scope of established practice requirements for the specialties of neurology, medical oncology, and neurosurgery, justifying the prerequisite of specialized training to practice neuro-oncology. Neuro-oncology advanced practitioners (AP) also require specialization beyond the scope of population-based generalist training and education. This quality improvement project's primary purpose was to develop a professional practice model (PPM) for APs employed at an academic medical center (AMC) ambulatory neuro-oncology practice. Using the focus, analyze, develop, execute, and evaluate (FADE) quality improvement methodology, the authors (1) reviewed literature and relevant professional organizations to identify possible professional competencies for neuro-oncology APs; (2) analyzed data to develop evidence-based practice domains; (3) used purposive sampling to recruit an interprofessional team of neuro-oncology experts; and (4) conducted a Delphi study with an interprofessional team of experts to gain consensus on practice domains and professional competencies. Twenty-three participants (n = 23) were recruited for the Delphi study, which was executed via electronic transmission using the Web-based software Qualtrics. After two rounds of the Delphi survey, the expert team reached consensus on six domains of practice, with 50 corresponding competency statements. Through interprofessional collaboration and consensus, this quality improvement project successfully created a PPM for an AMC neuro-oncology

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AP team. The PPM supports neuro-oncology APs by validating the unique set of skills that combines several specialties. The PPM provided the framework to standardize orientation and training, evaluate performance, and support the professional development of an AMC neuro-oncology AP team.

Neuro-oncology is a subspecialty that involves the neurological, medical, surgical, and oncologic management of primary central and peripheral nervous system neoplasms. Neuro-oncology practice manages the neurologic complications that result directly from the disease and provides symptom management related to the modalities used to treat the disease (American Academy of Neurology, 2013). In medicine, neuro-oncology practice falls outside the scope of established practice requirements for the specialties of neurology, medical oncology, and neurosurgery, justifying the prerequisite of specialized training in order to practice neuro-oncology (American Academy of Neurology, 2013).

There is a growing workforce of advanced practitioners (APs) in specialty care, especially in oncology, and the demand for their services will continue to grow (Coombs, 2015). Newly insured patients, an aging population, and long-term needs of survivors (American Society of Clinical Oncology, 2015) are driving the demand for cancer care. Advanced practitioners contribute significantly to quality oncology care through collaborative physician partnerships. There are a number of different models in which APs and physicians deliver care. These collaborations have demonstrated improved patient care, increased clinical productivity, improved access for new patients, urgent care patient management, survivorship care, and coverage of the academic physician (Coniglio, 2013; Shulman, 2013). However, there is a dearth in literature regarding standardized orientation practices of an AP working in specialty and subspecialty care.

Practice in neuro-oncology also requires AP specialization beyond the scope of generalist training and education currently provided by AP programs. Unfortunately, no postgraduate fellowships for APs provide the education and training necessary for neuro-oncology practice, and no standard professional competency framework exists.

BACKGROUND

This quality improvement project involves a neuro-oncology program in a hospital-based subspecialty clinic nested within a designated National Cancer Institute Comprehensive Cancer Center, an entity of a southern academic medical center. The mission of the neuro-oncology program is to improve the outcomes of patients with primary central nervous system tumors through laboratory, translational, and clinical research while providing supportive, quality care to patients and their families. Care delivery occurs through an interprofessional patient-centered care model.

Within the neuro-oncology program, the clinical care team includes physicians, APs, registered nurses (RNs), a clinical pharmacist practitioner, social workers, a psychiatrist, a neuropsychologist, and a child life specialist. Each clinical team comprises two or three physicians, four APs, and two RNs. Advanced practitioners and RNs support the panels of patients assigned to the respective physicians on their team.

Over the previous 6 years, the neuro-oncology program experienced substantial turnover at all levels. Reasons for attrition are multifactorial, but the turnover illuminated the inherent challenges of efficiently educating and training new staff, specifically APs. Ten APs were hired, eight of whom were new graduates. Of the new graduates, three resigned prior to completing 2 years of service. Adequately educating and training new providers while continuing to provide high-quality care has been challenging for the senior staff. Prior to this project, no standard orientation model existed. Additionally, as far back as 2012, it was documented as an action item in the meeting minutes of a clinical operations meeting (which includes physicians, APs, neuro-oncology fellows, and the administrative director) that as part of the collaborative practice between physicians and APs, core competencies for APs would be developed. Prior to this project, no work had been started.

The financial burden on this organization from staff turnover has been substantial. A rough

estimate of the direct and indirect cost of AP turnover at this academic institution is 1.5 times the incumbent's salary. At the start of this project, the minimum starting salary for APs was $67,000. Using *only the minimum* starting salary, the cost per person lost was approximately $100,000, which means turnover cost the program *at the very least* more than a million dollars over the past 6 years (Duke Human Resources, 2015). A market adjustment for fiscal year 2017 brought the starting salaries for APs up to $81,010 annually, which will increase the financial burden to the institution if AP turnover remains high.

Literature has demonstrated that an orientation for newly graduated APs without clear expectations increases AP turnover and overall job dissatisfaction (Sargent & Olmedo, 2013). Several studies have validated that structured orientation programs and professional development programs substantially improved retention rates (Opperman, Liebig, Bowling, Johnson, & Harper, 2016). Pursuing strategies for AP retention is a practical financial goal for health-care organizations.

OBJECTIVES AND AIMS

The purpose of this quality improvement project was to develop an innovative neuro-oncology professional practice model for the AP employed with the academic medical center neuro-oncology program. The project aims were to (1) use data from the literature review and professional organizations to develop evidence-based competencies for neuro-oncology advanced practice; (2) use the Delphi technique with an interprofessional team of experts to verify and gain consensus on professional competencies; and (3) use the newly created professional competencies along with information gleaned from a strengths, weaknesses, opportunities, and threats (SWOT) analysis to develop an orientation model for APs in the neuro-oncology program (Figure 1).

METHODOLOGY

Project Design

The project design utilized the quality improvement process FADE (focus, analyze, develop, execute, and evaluate) as the guiding framework for organization and implementation (US Department of Health and Human Services, 2015). The focus of the project was to identify professional competencies for APs in neuro-oncology by utilizing all relevant literature and resources from several professional organizations, including but not limited to, the American Academy of Neurology, the American Association of Colleges of Nursing, the National Organization of Nurse Practitioner Faculties, the American Association of Neuroscience Nurses, the Oncology Nursing Society, and the American Academy of Physician Assistants. The authors categorized competencies by practice domains.

Setting

The project was implemented in a subspecialty oncology practice within a designated National Cancer Institute Comprehensive Cancer Center. Findings from an organizational SWOT analysis

STRENGTHS

- Academic institution
- Board-certified neuro-oncologists
- Neuro-oncology fellowship for neurologists and oncologists = excellent resources and access to experts
- Collaborative practice with APs
- Supportive environment

WEAKNESSES

- No foundation for AP practice
- No standard competencies for neuro-oncology or subspecialty practice
- Current AP orientation lacks rigor
- AP role not clearly defined
- High AP turnover

OPPORTUNITIES

- Develop competency model
- Engage interdisciplinary team in consensus building
- Develop structured training and orientation for neuro-oncology APs
- Improve job satisfaction and retention of APs
- Improve performance
- Improve role transition

THREATS

- Organizational limitations
- Disengagement of colleagues related to actual or perceived threat of competency model
- Inability to reach consensus
- Lack of buy-in from stakeholders (MDs, APs, senior leadership)

Figure 1. SWOT analysis. AP = advanced practitioner.

performed by the authors elucidated the challenges related to organizational structure, culture, and climate that further validated the need for this quality improvement project (Figure 1). A SWOT analysis looks at internal and external factors that may affect an organization in either positive or negative ways (Moran, 2014).

Participants

Experts in this project had specific knowledge and experience in neuro-oncology practice. Inclusion criteria for the panel of experts for this project included current or former physicians and APs practicing both inpatient and outpatient neuro-oncology at Duke within the past 5 years. The authors deployed a purposive sampling technique to identify participants. The literature does not clearly describe the minimally sufficient number of participants for a Delphi study. Many Delphi studies have used 15 to 20 participants; however, 10 to 15 participants may be adequate if the group is homogenous (Hasson, Keeney, & McKenna, 2000; Hsu & Sandford, 2007). Other groups have found that seven is a suitable minimal panel size (Day & Boveva, 2005).

The expert panel for this project was heterogeneous because individuals were from several different professions; however, a homogenous characteristic was that all potential participants are experienced clinicians in neuro-oncology. For this project, the maximum number of expected participants was 23. Allowing for at least a 40% drop in response rate after each survey round, the results would be considered meaningful as long as the sample size remained greater than seven (Day & Boveva, 2005). There were participants from several southern and northern United States academic medical centers.

Ethical Approval

In addition to receiving institutional support, this project met the Duke University Health System Internal Review Board (IRB) criteria for a declaration of exemption from further IRB review as it did not meet the current descriptions for human subject research.

Methods

Using the Delphi technique, the authors conducted structured reiterative surveys with an interprofessional panel of experienced clinicians in adult neuro-oncology. The Delphi technique is different from traditional survey methods, whose goal is generalization. Rather, the validity of the method is rooted in the repeated cycles of surveys that over time demonstrate convergence of expert opinion on a given topic (Cole, Donohoe, & Stellefson, 2013). The authors conducted a minimum of two Delphi rounds, with the expectation of completing a third in order to reach consensus on the competencies. The authors achieved consensus through the iterative process of questioning that was executed via electronic transmission using the Web-based software Qualtrics. The Qualtrics platform was chosen because it required no specialized training for users and had no associated cost (i.e., the quality improvement project authors had institutional access to the software). Through each round of Qualtrics surveys and consistent with execution of the Delphi technique, participants were asked to (1) evaluate potential competency statements for neuro-oncology advanced practice on a seven-point Likert scale (where 1 = strongly agree and 7 = strongly disagree); (2) provide feedback and have the opportunity to suggest alternate phrasing; and (3) make suggestions for elements perceived to be missing that should be included.

The first-round survey included all the potential competencies identified from pertinent literature and professional organizations. A unique web address created by Qualtrics was included within an email sent to participants. When participants clicked on the link, they were taken to the survey, and Qualtrics tracked the unique user IP address to ensure each respondent completed the survey only once (Bohnenkamp, Pelton, Rishel, & Kurtin, 2014). The first survey remained open for approximately 3 weeks. Participants had the ability to write in competencies for inclusion in the next round. Survey responses were collected and analyzed. A summary report was produced and sent to all participants. The authors integrated the responses and feedback into the second-round survey.

Subsequent survey rounds were created and distributed in the same manner. Poor response rates are an inherent risk with surveys. Strategies to mitigate attrition of participants included maintaining up-to-date communication with the

project participants and sending email reminders to complete surveys (Day & Boveva, 2005; Donohoe, Stellefson, & Tennant, 2012). The minimum anticipated number of rounds for this project was two and the maximum was three. Figure 2 details the Delphi process for this project.

Privacy, Data Storage, and Confidentiality

Participants remained anonymous; no identifying information was collected or stored from the expert panel. Data was stored electronically on a password-protected encrypted network computer stored in a locked office. The project authors had sole access to the data. No protected health information was used in this project.

RESULTS

Participant Demographics

The participating experts practice neuro-oncology and have clinical expertise in neurology, medical oncology, and neuro-oncology. Twenty-three participants were recruited to participate in the Delphi rounds. Participants included doctors of medicine, a doctor of osteopathy, a doctor of nursing practice, physician assistants, nurse practitioners, and an administrative director. Of the sample (n =

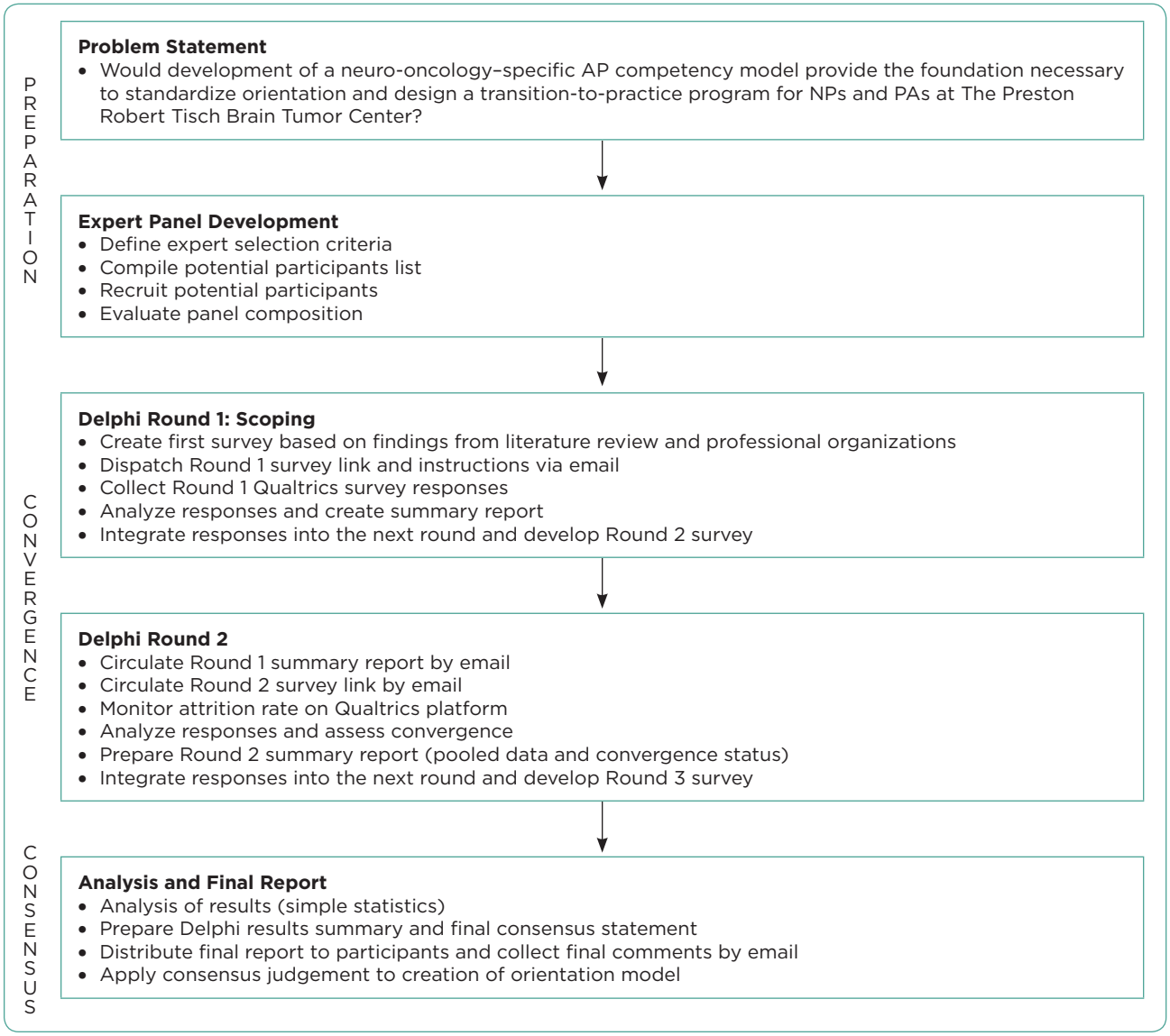

Figure 2. Delphi process map. APP = advanced practitioner; NP = nurse practitioner; PA = physician assistant. Adapted from Cole, Donohoe, & Stellefson (2013).

23), 39% were physicians, 57% were APs, and 4% were administrative. The majority of participants were female (70%).

Delphi Rounds

An extensive review of the literature and critical analysis of existing professional and clinical competencies identified six domains of practice. Seventy-eight competencies that correspond to the six domains of practice for neuro-oncology advanced practice were developed. The authors conducted two rounds of questioning from March 2016 through May 2016.

Delphi Round 1. For the first electronic round, participants were asked to evaluate the domains of practice with corresponding competency statements on a seven-point Likert scale (where 1 = strongly agree and 7 = strongly disagree). An individual email was sent to each participant with a secure link to the survey on the Qualtrics platform. During Round 1, participants were also asked to provide suggestions for language refinement or to add competency statements they felt should be present but were not.

Seventy-eight percent (18 of 23) of participants completed the Delphi Round 1 survey. There was overall agreement with all competency statements in the first round, with at least 60% of participants agreeing with all statements. No statements had more than one person who disagreed; therefore, no competencies were deleted. Consensus was reached with all statements during Round 1; therefore, Round 2 was used to incorporate all feedback received and to validate the results of the first round.

Delphi Round 2. In response to the suggested language refinement and the addition of a competency, the Round 2 survey was developed. The same format was used: Participants were again asked to evaluate six domains of practice with corresponding competency statements on a seven-point Likert scale (where 1 = strongly agree and 7 = strongly disagree). Six domains of practice and 50 competency statements were included in the second round. The surveys were distributed electronically to all 23 participants on May 7, 2016, and left open until May 20, 2016. An email reminder was sent to participants after the survey had been open for 1 week.

Fifty-two percent (11 of 21) of participants completed the second round of the Delphi survey. Two participants left the institution prior to starting the second round and declined further participation. Consistent with the literature, there was a 40% drop in response rate between rounds; however, the sample size remained above seven, so the results remain significant (Day & Boveva, 2005). Additionally, all participants had expertise in the subject matter, achieving content validity of results.

The Delphi process validated the final competency framework, and within each practice domain experts reached consensus on all competency statements (Table 1). No additional edits or suggested revisions were offered in the second round. Six domains of practice with 50 corresponding competency statements for neuro-oncology APs were agreed upon. Using the information gleaned from the SWOT analysis and competencies, the authors created a 90-day orientation program for neuro-oncology APs (Figure 3).

DISCUSSION

Neuro-oncology practice is a subspecialty that combines the practice of several disciplines and requires training and education beyond generalist advanced practice graduate programs. The primary purpose of this project was to utilize the Delphi technique to gain consensus on professional competencies for APs in neuro-oncology at an academic medical center. The competency framework offered a baseline to develop a standardized onboarding and transition-to-practice policy for an academic medical center neuro-oncology program. A group of neuro-oncology experts developed the framework, which includes six domains of practice and, within those domains, 50 professional competencies. The orientation program includes both onboarding (basic institutional activities) and a 90-day neuro-oncology–specific orientation (Figure 3). The program outlines the anticipated clinical conditions and procedures for AP orientation and allows for modification depending on the specific needs of the new provider. This work has educational, practice, and additional quality improvement implications.

Implications

No national specialty standards or certifications for advanced practitioners specific to neuro-oncology exist. Development of the competency model em-

Table 1. Neuro-oncology Advanced Practitioner Competencies for The Preston Robert Tisch Brain Tumor Center at Duke (Delphi Round 2 Consensuses)

Domain 1: Medical Knowledge[a]

Medical knowledge includes the synthesis of pathophysiology, patient presentation, and the neurological, medical, surgical, and oncologic management of primary central and peripheral nervous system neoplasms.

- Demonstrate knowledge of established and evolving biomedical and clinical sciences, and apply knowledge to the practice of adult neuro-oncology, including but not limited to:
  1. Management of adult primary nervous system tumors: use of medical neuro-oncologic therapeutics, including chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in neuro-oncology patients
  2. Indications for standard and investigational surgical, radiation, and medical therapies for primary central and peripheral nervous system neoplasms
  3. Management of systemic cancer-related neurologic disorders: adverse event of reactions to surgical, medical, and radiation treatment of neuro-oncology patients; cerebrovascular disease, seizures, increased intracranial pressure, vasogenic edema, deep vein thrombosis, neutropenia, thrombocytopenia, anemia, use of blood products and growth factor support, headache management, cognitive dysfunction, palliative care, and end-of-life care

Domain 2: Patient Care[b]

Patient care competencies describe the role of the neuro-oncology AP in assessing all aspects of the patient's health status, including for purposes of health promotion, health protection, and disease prevention.

- Obtain and document a comprehensive health history, physical, and neurological exam for patients with a past, current, or potential diagnosis of a primary central and peripheral nervous system neoplasm
- Assess symptoms commonly seen in patients with a brain tumor (e.g., fatigue, pain, nausea, vomiting, headache, seizures) or for common signs and symptoms related to disease progression or recurrence
- Conduct a pharmacologic assessment, including over-the-counter medications, prescription drugs, nutritional supplements, and other complementary, alternative, and integrative therapies to identify any potential interactions with cancer therapeutics, and consult with a clinical pharmacist as necessary
- Perform a comprehensive assessment of functional status and the impact on activities of daily living, including but not limited to the following domains: psychological, role, social, cognitive, and physical, and refer to appropriate support services
- Assess for the presence of psychological comorbidities (e.g., anxiety/depression, substance use), past and present coping skills, and the psychosocial impact of the brain tumor experience; identify psychiatric disorders and common psychiatric sequela of brain tumors; anticipate management of these (pharmaceutical, CBT, therapeutic communication, etc.) and refer to adjunct staff neuro-psychology and psychiatry
- Assess concerns and issues related to sexual function, sexual well-being, and fertility of patients undergoing cancer treatment
- Facilitate patients' ability to navigate the complex health-care system and overcome the barriers to continuity, coordination, and communication among multiple care providers
- Perform initial interpretation of laboratory studies and diagnostic tests, including but not limited to chest x-ray, electrocardiogram, brain MRI, head CT

Note. AP = advanced practitioner; CBT = cognitive behavioral therapy; MRI = magnetic resonance imaging; CT = computed tomography.
[a]Information from American Academy of Neurology (2013); American Nurses Credentialing Center (2014).
[b]Information from Knopf (2011); National Commission on Certification of Physician Assistants (2012); National Organization of Nurse Practitioner Faculties (2012); Oncology Nursing Society (2007); Stewart-Amidei et al. (2010).
[c]Information from American Academy of Neurology (2013); Knopf (2011); National Commission on Certification of Physician Assistants (2012); Oncology Nursing Society (2007).
[d]Information from Interprofessional Education Collaborative Expert Panel (2011); National Commission on Certification of Physician Assistants (2012).
[e]Information from Knopf (2011); National Commission on Certification of Physician Assistants (2012); National Organization of Nurse Practitioner Faculties (2012); Oncology Nursing Society (2007); Stewart-Amidei et al. (2010).
[f]Information from National Commission on Certification of Physician Assistants (2012); National Organization of Nurse Practitioner Faculties (2012); Oncology Nursing Society (2007).

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Table 1. Neuro-oncology Advanced Practitioner Competencies for The Preston Robert Tisch Brain Tumor Center at Duke (Delphi Round 2 Consensuses) (cont.)

Domain 2: Patient Care[b] (cont.)

- Collaborate with the multidisciplinary team, patient, family, and caregivers to formulate a comprehensive plan of care for patients with a brain tumor; plan for the management of brain tumor–related and cancer treatment–related symptoms (e.g., pain, nausea/vomiting, neuropathies, infection, headaches, seizures)
- Demonstrate awareness of appropriate clinical trials and research studies for which patients may be eligible and assist in recruiting patients as appropriate
- Facilitate patient and family decision-making regarding complex treatment; coordinate palliative and end-of-life care in collaboration with patients, families, caregivers, and other members of the multidisciplinary health-care team

Domain 3: Practice-Based Learning and Improvement[c]

Practice-based learning and improvement includes the processes through which APs engage in critical analysis of their own practice experience, the medical literature, and other information resources for the purposes of self- and practice-improvement. Neuro-oncology APs must be able to assess, evaluate, and improve their patient care practices.

- Apply evidence-based practice using quality improvement strategies in providing care to patients with brain tumors
- Participate in the design and implementation of evidence-based protocols and processes of care to improve outcomes for patients with brain tumors (e.g., decreasing medication errors, reducing infection rate, pain management)
- Use internal resources (e.g., ethics committee, risk management, legal department) and external resources (e.g., professional organizations, government officials, community agencies) to facilitate the resolution of moral and ethical issues
- Advocate for patient/family rights to make decisions regarding durable power of attorney, advance directives, and related issues
- Recognize and appropriately address personal biases, gaps in medical knowledge, and physical limitations in themselves and others

Domain 4: Interprofessional Collaboration and Communication Skills[d]

Collaborative competencies are those that the neuro-oncology AP needs to work together with others, such as other specialties within a profession, between professions, with patients and families, and within and between organizations. Communication skills encompass the verbal, nonverbal, written, and electronic exchange of information.

- Work with individuals of other professions to maintain a climate of mutual respect and shared values
- Use the knowledge of one's own role and those of other professions to appropriately assess and address the health-care needs of the brain tumor population.
- Explain the roles and responsibilities of other care providers and how the team works together to provide care
- Engage health-care professionals who complement one's own professional expertise, as well as associated resources, to develop strategies to meet specific patient care needs
- Communicate with team members to clarify each member's responsibility in executing components of a treatment plan or intervention
- Engage in continuous professional and interprofessional development to enhance team performance
- Express one's knowledge and opinions to team members involved in patient care with confidence, clarity, and respect, working to ensure common understanding of information, treatment, and care decisions

Note. AP = advanced practitioner; CBT = cognitive behavioral therapy; MRI = magnetic resonance imaging; CT = computed tomography.
[a]Information from American Academy of Neurology (2013); American Nurses Credentialing Center (2014).
[b]Information from Knopf (2011); National Commission on Certification of Physician Assistants (2012); National Organization of Nurse Practitioner Faculties (2012); Oncology Nursing Society (2007); Stewart-Amidei et al. (2010).
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[f]Information from National Commission on Certification of Physician Assistants (2012); National Organization of Nurse Practitioner Faculties (2012); Oncology Nursing Society (2007).

Table 1. Neuro-oncology Advanced Practitioner Competencies for The Preston Robert Tisch Brain Tumor Center at Duke (Delphi Round 2 Consensuses) (cont.)

Domain 4: Interprofessional Collaboration and Communication Skills[d] (cont.)

- Listen actively, and encourage ideas and opinions of other team members
- Give timely, sensitive, instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from others
- Use respectful language appropriate for a given difficult situation, crucial conversation, or interpersonal conflict
- Demonstrate emotional resilience and stability, adaptability, flexibility, and tolerance of ambiguity and anxiety
- Adapt communication style and messages to the context of the interaction
- Accurately and adequately document information regarding care for medical, legal, quality, and financial purposes

Domain 5: Professionalism[e]

Professionalism is the expression of positive values and ideals as care is delivered. It involves prioritizing the interests of those being served above one's own. Neuro-oncology APs must acknowledge their own professional and personal limitations, as well as demonstrate a high level of responsibility, ethical practice methods, and behaviors that reflect a commitment to continuous professional development.

- Build collaborative, interdisciplinary relationships to provide optimal care to patients with brain tumors
- Promote life-long learning and evidence-based practice while continually acquiring knowledge and skills needed to improve patient care
- Participate in community and professional organizations that influence brain tumor care and support the role of the neuro-oncology AP
- Contribute to the knowledge base of the health-care community through community outreach, involvement in professional organizations, presentations, publications, and participation in research
- Maintain professional competence and credentials appropriate to the role and specialty
- Disseminate knowledge required to care for patients with brain tumors to other health-care workers and caregivers through peer education, staff development, mentoring, and preceptor experiences
- Translate research findings and other evidence to improve the care of patients with brain tumors
- Participate in clinical and supportive care research to promote positive outcomes for patients with brain tumors and their caregivers
- Advocate within the health-care system and policy arenas for the health needs of patients with brain tumors

Domain 6: Systems-Based Practice[f]

Systems-based practice encompasses the societal, organizational, and economic environments in which health care is delivered. Neuro-oncology APs must demonstrate an awareness of and responsiveness to the larger system of health care to provide patient care that balances quality and cost.

- Assist patients with brain tumors and their families and caregivers in negotiating health-care delivery systems
- Create and enhance positive, health-promoting environments that maintain a climate of dignity and privacy for patients with brain tumors

Note. AP = advanced practitioner; CBT = cognitive behavioral therapy; MRI = magnetic resonance imaging; CT = computed tomography.
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Table 1. Neuro-oncology Advanced Practitioner Competencies for The Preston Robert Tisch Brain Tumor Center at Duke (Delphi Round 2 Consensuses) (cont.)

Domain 6: Systems-Based Practice[f] (cont.)
• Identify aspects of the health-care system that create barriers to comprehensive cancer care and long-term care for brain tumor survivors
• Incorporate knowledge of payment, reimbursement systems, and financial resources into the plan of care for patients with a brain tumor
• Document clinical services provided in accordance with reimbursement regulations and institutional policies
• Adhere to institutional, state, and federal laws and regulations related to the care of patients with brain tumors
• Refer patients to appropriate local, state, and national patient-support resources

Note. AP = advanced practitioner; CBT = cognitive behavioral therapy; MRI = magnetic resonance imaging; CT = computed tomography.
[a]Information from American Academy of Neurology (2013); American Nurses Credentialing Center (2014).
[b]Information from Knopf (2011); National Commission on Certification of Physician Assistants (2012); National Organization of Nurse Practitioner Faculties (2012); Oncology Nursing Society (2007); Stewart-Amidei et al. (2010).
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[f]Information from National Commission on Certification of Physician Assistants (2012); National Organization of Nurse Practitioner Faculties (2012); Oncology Nursing Society (2007).

phasizes the unique set of skills that combines several specialties and provides a framework for a professional practice model. Aside from the development of a standard onboarding and orientation model, the competencies offer a standard against which to evaluate job performance and support professional development. The practice implications of this project offer several quality improvement opportunities.

Retention strategies can help organizations reach realistic financial goals. It will be important to monitor the AP turnover rate over the next 5 years in the brain tumor center to evaluate if a standardized, rigorous orientation increases retention. The financial return on investment could be significant. It would be interesting to compare the longevity of APs who have completed the standard orientation in the brain tumor program with that of APs who did not go through the program.

Other quality improvement opportunities include assessing the impact of the program on job satisfaction as well as successful transition to practice. Additionally, it could be postulated that a stable medical team will improve the patient's experience. This project pursues the triple aim by aspiring to improve the patient experience through the assurance of competent, patient-centered care and to indirectly decrease per capita cost by improving the retention of highly qualified providers, thereby saving the health system thousands of dollars. By continually evaluating the impact of this project on the people who participate in the program as well as how the outcomes may affect the health system, sustainability of this work will be maintained.

Limitations

The outcomes from this quality improvement project are generalizable only to the setting in which the project was implemented. However, there is the absolute potential for the work to be duplicated or adapted to other neuro-oncology teams and subspecialty settings. The Delphi technique is a particularly useful avenue to gain consensus on sensitive or complex topics. It allows for participants to more freely express views that may be different from the majority or that otherwise may not be shared. It is structured communication that fosters inclusiveness. Utilization of the Delphi technique for the neuro-oncology advanced practice competency development was a viable technique that would be used again by the authors. Suggestions for improvement in the execution of the Delphi technique include using the research portal (in this case, the Qualtrics platform) to share information in order to validate the

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9-12
General orientation activities									
Computer, badge, pager, parking	■								
DUMC orientation	■	■							
Duke Medicine LMS modules	■								
Collaborative Institutional Training Initiative	■	■	■						
OESO safety training	■	■							
Compliance training	■	■	■						
Maestro training	■	■	■						
Research team		■							
Family support program			■						
Radiation oncology				■					
Professional education									
Review neuro-oncology AP competencies	■								
MNO AP clinical practice library readings	■	■	■	■	■	■	■	■	■
ASCO University oncology education[a]	■								
Clinical expectations									
Shadowing with MDs; limited responsibility	■								
Initiate mentored direct patient care	■								
1–2 patients per clinic session	■	■							
2–3 patients per clinic session	■	■	■						
3–4 patients per clinic session	■	■	■	■					
4–5 patients per clinic session	■	■	■	■	■				
5–6 patients per clinic session	■	■	■	■	■	■	■	■	■
Manage 1 consult			■	■	■	■	■	■	■
Manage 2 consults				■	■	■	■	■	■
Participate in AP-only clinics					■	■	■	■	■
Participate in full-day clinics							■	■	■
Performance review									
Mentor/mentee	■	■	■	■	■	■	■	■	■
Administrative director	■		■		■		■		■
Supervising physician				■				■	
90-day performance evaluation									■

Figure 3. The Preston Robert Tisch Brain Tumor Center 12-week advanced practitioner orientation timeline. DUMC = Duke University Medical Center; LMS = learning management system; OESO = Occupational and Environmental Safety Office; AP = advanced practitioner; MNO = medical neuro-oncology; ASCO = American Society of Clinical Oncology.
[a]To be completed within 6 months of employment.

process with the participants rather than communicating results via email (Donohoe et al., 2012). It is important to note that there is no standard application procedure of the Delphi method, especially electronically; however, an abundance of literature describes best practices for executing

the technique with rigor. This is acknowledged as a limitation, and if the technique is applied without thoughtful consideration, the internal validity of the findings will be affected.

Conclusions

This quality improvement project successfully created the foundation of advanced practice in a neuro-oncology program of an academic medical center. An application of a structured communication technique with an interprofessional group reached consensus after two rounds on 50 professional competencies for the APs. The competencies served as a framework to create a standard orientation model to support advanced providers new to neuro-oncology. This project supports AP practice and provides the avenue to maintain a unique skill set that ensures the provision of safe, quality, competent patient care.

Disclosure

The authors have no conflicts of interest to disclose.

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