# Physical Therapy Residency and Fellowship Education: Reflections on the Past, Present, and Future

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The physical therapy profession continues to respond to the complex and changing landscape of health care to meet the needs of patients and the demands of patient care. Consistent with this evolution is the rapid development and expansion of residency and fellowship post-professional programs. With the interested number of applicants exceeding the number of residency and fellowship slots available, a "critical period" in the educational process is emerging. The purposes of this perspective article are: (1) to analyze the state of residency and fellowship education within the profession, (2) to identify best practice elements from other health professions that are applicable to physical therapy residency and fellowship education, and (3) to propose a working framework grounded in common domains of competence to be used as a platform for dialogue, consistency, and quality across all residency and fellowship programs. Seven domains of competence are proposed to theoretically ground residency and fellowship programs and facilitate a more consistent approach to curricular development and assessment. Although the recent proliferation of residency and fellowship programs attempts to meet the demand of physical therapists seeking advanced educational opportunities, it is imperative that these programs are consistently delivering high-quality education with a common focus on delivering health care in the context of societal needs.

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[Furze JA, Tichenor CJ, Fisher BE, et al. Physical therapy residency and fellowship education: reflections on the past, present, and future. *Phys Ther*. 2016;96:949–960.]



Published Ahead of Print: December 17, 2015
Accepted: December 6, 2015
Submitted: August 23, 2015

Historically, the physical therapy profession has grown and evolved in response to the dynamic and changing needs of society.[1–4] Since the beginning of the profession early in the 20th century, first as reconstruction aides working with wounded veterans and then with patients during the poliomyelitis epidemic under the direction of physicians, physical therapists have responded to the prevailing societal health needs.[5] Only later were physical therapists given latitude to practice autonomously, and the profession continues to be challenged to achieve goals of direct access by patients who seek physical therapy as a part of their primary care.[6,7] Worthingham said it well: "If physical therapists are to assume a professional role in relationship to other health professions, including medicine, a closer approach to peer equivalence, mutual respect, and recognition of responsibility is essential."[8(p1316)] Physical therapists have responded to the continual changes in the health care system and increased societal needs for access to patient care by assuming enhanced clinical responsibilities. These expanded roles include first-contact management, often described as primary care, or patient management that includes diagnosis, referral to other practitioners, and delegation to and supervision of other support professionals. Given these evolving and increased responsibilities, the profession has undergone significant transformation in the educational preparation of physical therapists moving from bachelor's to master's degrees and then to clinical doctoral degree entry-level education.[5,9–11]

Consistent with the changes in educational preparation of physical therapists has been the creation of clinical specialists and, more recently, the rapid development of residency and fellowship programs in an attempt to meet the need for advanced knowledge and skills in a specialized area of practice. Residency programs are postprofessional, occurring at some point in time after graduation and licensure, with the intention of advancing the physical therapist's knowledge and skills in patient/client management in a specialized area of practice (eg, geriatrics, orthopedics, neurology, pediatrics).[12] The *Description of Specialty Practice* (DSP), developed by the clinical specialty sections of the American Physical Therapy Association (APTA), is used to guide the residency program curriculum and ensure that the program reflects the entire spectrum of practice analysis in the given specialty area.[13,14] In addition to the DSP, the American Board of Physical Therapy Residency and Fellowship Education (ABPTRFE) has recently developed draft forms of a *Description of Residency Practice* (DRP) to supplement the DSP and better describe the expectations for residency practice. These documents were created to address issues of program variability and inconsistent learning opportunities for the resident within a given specialty area of clinical practice.[15]

The structured educational experience must include both didactic and clinical components and emphasize the foundational piece of ongoing mentorship. As defined by ABPTRFE, mentoring is a continual learning experience focused on patient/client management.[12,16,17] The majority of mentorship time must occur over direct patient care where the resident, mentor, and patient are present. Mentorship is a critical and essential component of residency and fellowship programs consistent with the development of advanced practitioners in the health professions.[12,18] Fellowship programs are designed with greater depth in a subspecialized area of clinical practice and require participants to have already demonstrated a level of knowledge and skill that comes from a completion of specialist certification, residency, or demonstrated level of specialized clinical skill.[19] For example, a physical therapist may pursue an orthopedic manual therapy fellowship following completion of an orthopedic residency program or recognition as an Orthopedic Clinical Specialist (OCS). Each *Description of Advanced Specialty Practice* (DASP) is a validated practice analysis in a specific content area and used to guide the curriculum of fellowship programs.[19]

The increased demand for advanced specialized clinical knowledge and skills by graduating physical therapist students and practicing clinicians far exceeds the current supply of accredited residency and fellowship programs. During 2013, 167 accredited residency and fellowship programs were required to submit an annual report to ABPTRFE. Programs reported a total of 540 individuals admitted from a pool of 1,428 applicants; the extent to which these applicants had applied to multiple programs is unclear (Kendra L. Harrington, PT, DPT, MS, WSC; email communication; July 2015). Final numbers for 2014 were not yet available at the time this article was written; however, all signs indicate the applicant pool will continue to grow at a rate far exceeding the number of slots offered by accredited programs. These applicant and admission numbers are a driving force in residency and fellowship education. Simultaneously, there is a significant need for the development of standards and models for delivery of curriculum and mentoring practices to support the design and implementation of high-quality programs. With increasing numbers of applicants to a relatively small number of accredited residency and fellowship programs, a "critical period" in residency and fellowship education has emerged.

Currently, little is known about the similarities and differences in programs within and across clinical specialty areas or the depth and quality of the teaching and learning environment that lead to optimal outcomes.[20–23] Although the accreditation process requires programs to meet a set of minimal criteria, just as with the Commission on Accreditation in Physical Therapy Education (CAPTE) in professional doctor of physical therapy education, significant variability across programs is possible. Thus, the purposes of this perspective article are: (1) to summarize and analyze the state of residency and fellowship education within the profession, (2) to identify best practice elements from other health professions that are applicable to physical therapy residency and fellowship education, and (3) to propose a foundational set of common domains of competence that would apply to all residency and fellowship programs to guide curricular development and assessment.

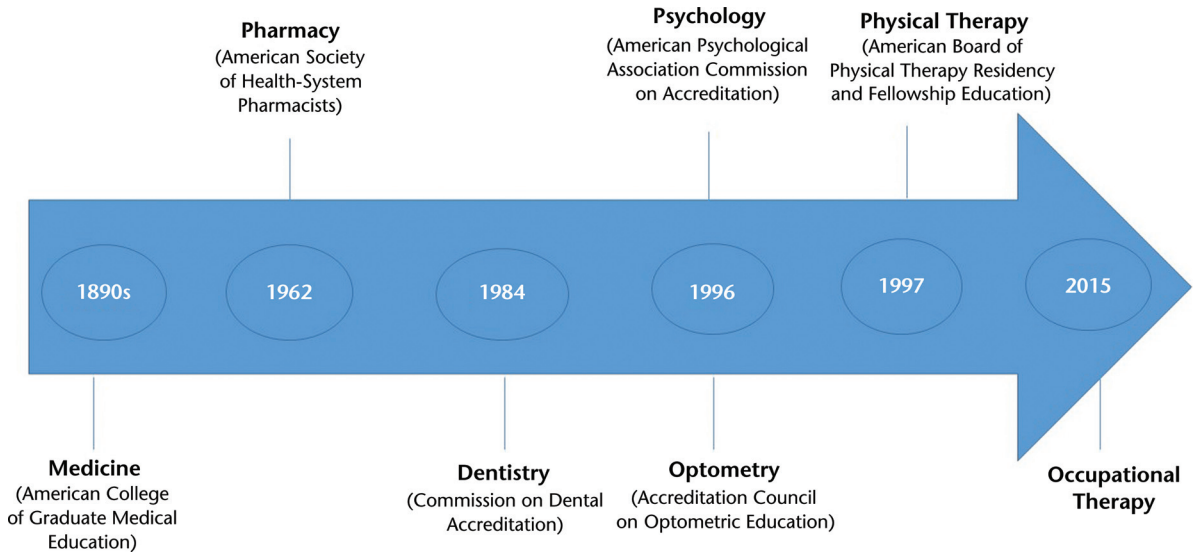


**Figure 1.**
Residency development across the health professions.

## History of Residency and Fellowship Education in Physical Therapy

The evolution of residency and fellowship education in physical therapy is similar to the direction taken by other health care education programs that also terminate in a clinical doctoral degree, as shown in Figure 1.[24] Medicine, pharmacy, podiatry, and optometry have long professed the need for a training period during which the novice clinician continues to gain knowledge and skill under the auspices of the more experienced clinical expert.[25] This training period allows for continued guidance as novice clinicians become competent in the development of their clinical reasoning, judgment, and psychomotor skills.

The historical development of residency and fellowship education in physical therapy dates back many years and has been most notable during the past 2 decades since APTA became actively involved in the process.[26] The landmark events related to residency development in our profession are discussed in the Appendix, with highlights of key events visually depicted in a time-line format in the eFigure (available at ptjournal.apta.org).[22,25,26] The first residency and fellowship education programs were credentialed by ABPTRFE in 2000. The terminology to address those programs recognized for meeting a defined set of criteria changed from "credentialed" to "accredited" in 2014 to better reflect the evolution and align with the existing process in other health professions.[12,26]

## Current State of Physical Therapy Residency and Fellowship Education

As of October 2015, there were 199 accredited residency programs in 11 specialty areas and 41 accredited fellowship programs focused in 9 subspecialty areas, as depicted in Table 1 (Kendra L. Harrington, PT, DPT, MS, WCS; email communication; October 2015).[27,28] Significant growth in the number of residency and fellowship programs and graduates has occurred over the past 5 years.[20,28] In 2009, there were 81 accredited programs and then 213 in 2014, representing a 163% increase (Kendra L. Harrington, PT, DPT, MS, WCS; email communication; October 2015). There has been unequal geographic distribution of residency and fellowship programs from the time they were first accredited until more recently. Initially, the East Coast and West Coast had strongholds in the number of residency and fellowship programs. These educational programs were concentrated in urban areas and associated with health maintenance organizations,[20] private practice settings, and selected universities that were the "early adopters" of the value of residency education. However, over the past several years, a much broader distribution of programs has emerged across the United States. This geographic spread has been the result of the growing number of residencies and fellowships.

Closer examination of the list of accredited programs reveals that there is indeed geographic distribution in the Northeast, South, West, and Midwest areas of the United States.[27,28] Despite this extensive growth in number of programs and geographical distribution, an unequal allocation of specialty and subspecialty programs exists. As shown in Table 1, the largest total number of programs are in the area of orthopedics, including both orthopedic residency programs and orthopedic manual physical therapy fellowships. Responding to societal needs and workforce distribution continues to be an important consideration for the profession as additional residency and fellowship programs are developed. For example, should the profession be concerned about developing more geriatric residencies given the aging population in the United States?[4] If residency programs are an important component of advancing practice for physical therapists and meeting societal needs, a broader distri-

**Table 1.**
Number of Residency and Fellowship Programs (as of October 2015)

| Residency Programs | No. of Residency Programs | Fellowship Programs | No. of Fellowship Programs |
|---|---|---|---|
| Specialty area | Total=199 | Subspecialty area | Total=41 |
| Acute care | 1 | Critical care | 3 |
| Cardiovascular and pulmonary | 5 | | |
| Clinical electrophysiology | 1 | | |
| Geriatrics | 13 | | |
| Neurology | 31 | | |
| Orthopedics | 93 | Spine | 2 |
| | | Movement science | 1 |
| | | Orthopedic manual physical therapy | 25 |
| | | Hand therapy | 2 |
| Pediatrics | 17 | Neonatology | 2 |
| Sports | 29 | Sports Division I | 2 |
| | | Upper extremity athlete | 3 |
| Women's health | 8 | | |
| Wound care | 1 | | |
| Faculty (programs seeking accreditation) | | Higher education leadership | 1 |

bution of residency programs in all specialty areas is critical.[4,20]

As the profession continues to evolve, pioneers within physical therapy have identified the need to explore the benefits and clinical outcomes of residency and fellowship education.[20,22,23] More than 15 years ago, Tichenor and colleagues challenged the profession to evaluate the patient outcomes of residency- and fellowship-educated physical therapists versus nonresidency- and fellowship-educated physical therapists in an effort to support the financial sustainability of these programs to employers.[22,23] Recently, the first published study to address this comparison showed differences in patient outcomes between therapists who had undergone fellowship training compared with residents and those without formal postprofessional training. In the study by Rodeghero et al,[29] patient outcomes were significantly better when the intervention was provided by fellowship-trained as compared with residency-trained or nonresidency-trained physical therapists. Given the fact that many residents enter residency education as new graduates of doctor of physical therapy programs, it should not be surprising that the residents in the study sample were younger and had less experience than their fellowship-trained or nonresidency-trained counterparts. Thus, the reasons for these differences could be attributed to the residents having a lack of experience with varied patient presentations, resulting in limited clinical expertise and a reduction in overall patient outcomes.[30] A shortcoming of recent research in residency/fellowship education is the sole focus on patient outcomes without consideration of other important contextual factors that influence learning and ultimately clinical outcomes, including the clinician's continued professional development and emerging clinical expertise.

In another study comparing nonpatient care skills, including leadership abilities and professional development, graduates of residency programs demonstrated advanced leadership and other professional skills and earned a higher income compared with nonresidency-trained graduates.[31] Graduate outcomes research in residency and fellowship education needs to take a broader view of the contextual factors that are critical components of the teaching and learning environment, as these factors also may contribute to enhanced clinical outcomes through the development of advanced clinical reasoning skills, effective clinical practice, and patient-centered care. For example, we need to know more about the mentor characteristics and teaching strategies used within residency and fellowship programs that may lead to positive patient engagement and satisfaction. We know that clinical experience grounded in reflective practice is an important component of the ongoing development of expertise.[32–36] As with other professions where clinical outcomes are dependent on another person for human improvement, there is inherent complexity involved in this process.

Physical therapy is similar to other caring professions in that we rely on the patient or client to engage in activities to enhance his or her human performance.[4,37] This is where the clinical reasoning skills of the therapist in understanding the patient's life context are so critical. There is strong evidence across professions that clinicians' ability to fully understand these important patient contextual elements is an essential component of their clinical reasoning process central to developing expertise.[38–42] The physical therapy profession needs to consider the outcomes of residents' and fellows' leadership and professional skills, teaching and learning strategies, and curriculum competencies, including integration of the patient's life factors into the clinical reasoning process. These factors should be considered in combination with patient outcome measures to determine the educational effectiveness of residency and fellowship programs.[30,31,34]

Thus far, the profession has placed much more focus on the development of programmatic structure through specific accreditation standards and resource materials (eg, mentoring and caseload requirements, length of programs) to improve the quality of programs rather than advocating for investigations exploring critical research questions in

**Table 2.**
Accreditation Council for Graduate Medical Education General Competency Domains in Medical Residency Education

| Competency Domain | Competency Definition |
|---|---|
| Patient care | Provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. |
| Knowledge for practice | Demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. |
| Interprofessional collaboration | Demonstrate the ability to engage in an interprofessional team in a manner that optimizes safe, effective patient and population-centered care. |
| Interpersonal and communication skills | Demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. |
| Professionalism | Demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. |
| Practice-based learning and improvement | Demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and lifelong learning. |
| Systems-based practice | Demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. |
| Personal and professional development | Demonstrate the qualities required to sustain lifelong personal and professional growth. |

residency and fellowship education.[14] Kulig argued that the profession can enhance the quality and integrity of these residency educational programs by grounding them in clinical research with established partnerships or collaborations with academic institutions to ensure appropriate learning experiences expected of this advanced training.[20] We believe there are multiple opportunities for research in residency and fellowship education that need to be directed at the exploration of the teaching and learning environment that is central to the mentorship process.

## Lessons From the Health Professions

Although residency and fellowship education is still considered to be in its infancy within physical therapy, medicine and pharmacy have used this model of postprofessional education to further the education and training of specialists within specific disciplines for many decades. Medicine first required residency as part of advanced training in the early 1900s (Fig. 1). The professions of pharmacy, dentistry, psychology, and optometry followed the medical model by offering residency training programs, although not requiring residency as part of entry-level professional education, as had been mandated by medicine.[25] All of these professions have embraced residency as an important component of continued professional development and intentional practice-based learning that offers key considerations for physical therapy. Medicine established a formal, national process for accreditation of residency programs. The oversight organization is the Accreditation Council for Graduate Medical Education (ACGME), established in 1981, replacing earlier oversight by the Liaison Committee for Graduate Medical Education. The ACGME is an independent accrediting organization with separate review committees for each of 130 specialty and subspecialty areas.[43]

As the most mature profession with residency education, medicine provides us with a structure and processes for consideration. During the late 1990s, in response to public demand for improved patient safety, reduced medical errors, and increased responsibility for residency training, the ACGME developed the Outcomes Project, focusing on outcomes-based assessment as a foundation for medical residency curricular design and assessment.[44–46] During this movement, residency program directors were asked to objectively document how their residents achieved proficiency in 8 general domains of competence (Tab. 2).[47] Prior to the outcomes movement, assessment of medical residency education was primarily centered on time-based training. In this time-dependent model, once the resident had completed 2 years of educational (clinical and didactic) training, he or she was deemed "fit for practice." This shift in curricular design and assessment from solely time-based training toward demonstration of competence with a timed component, designated as the "Flexnerian revolution of the 21st century,"[48] was aimed at enhancing the medical profession's ability to verify that graduates of residency programs are competent.[47–50]

Since the inception of the Medicare and Medicaid programs in 1965, the federal government has provided significant dollars to fund graduate medical education, including residency and fellowship programs.[51] As an accountability measure for this public funding, residents must demonstrate the ability to deliver safe and effective patient care.[48] Competency domains are considered overarching elements critical to professional practice, and competencies are considered broad and general qualities of a professional. The difficulty with assessing such an expansive concept is the tendency to reduce this general idea into a long list of activities or skills that are observable in a clinical setting but in isolation may not accurately represent the competency.[52] Given this challenge, entrustable profes-

**Table 3.**
Glossary of Terms

| Term | Definition | Examples From Medicine[54] | Examples From Medicine[54] | Examples From Medicine[54] |
|---|---|---|---|---|
| Domains of competence | Overarching elements, critical to a professional[52,54] | Knowledge for practice | Interprofessional collaboration | Systems-based practice |
| Competency | Ability to do something successfully[53]<br>Broad, general, personal qualities of a professional[52]<br>Ability to integrate knowledge, skills, values, and attitudes[54] | Demonstrate an investigatory and analytic approach to clinical situations | Work effectively with others as a member or leader of a health care team or other professional group | Identify systems failures and contribute to a culture of safety and improvement |
| Entrustable professional activities | Professional activities that comprise the foundational elements of a profession[52]<br>Units of professional practice, defined as tasks or responsibilities that all trainees can perform unsupervised once they have attained competence in that area[54] | Gather a history and perform a physical examination | Actively work to integrate into team function and meet or exceed the expectations of his or her given role | Attend to the needs of individual patients and act within the defined medical role to address an issue or problem that is confronting an individual or population of patients<br>May enlist colleagues to help with this problem |

sional activities (EPAs), as defined in Table 3,[52–54] have been recognized as the linkage between competencies and specific performance-based actions for demonstrating competence in patient care.[55–57] Entrustable professional activities are independently executable, observable, and measurable and, therefore, can function as a quantifiable outcome that can aid in the assessment of the resident.[52,54] To better understand the terminology described in this article, definitions, concepts, and specific examples of domains of competence, competency, and EPAs are presented in Table 3.[52–54]

Medicine is actively working on implementing an outcomes-based competency framework in residency education to guide curricular development and assessment and shift away from time-based, checklist-type evaluations.[47,52,54] Eight core competency domains—patient care, knowledge for practice, interprofessional collaboration, interpersonal and communication skills, professionalism, practice-based learning and improvement, systems-based practice, and personal and professional development— cross all specialty areas in graduate medical education, the equivalent of residency and fellowship education in physical therapy.[47,54] In addition to these domains of competence, medicine has developed correlating EPAs that serve as objective and measurable outcomes for the purpose of assessment.[54] The medical profession has been aware of the difficult transition between undergraduate school and medical school, medical school and residency, and residency and fellowship education. Thus, our colleagues from medical education are using specific panels of experts to evaluate learning over the continuum of time, from undergraduate medical education to residency and fellowship training, to determine core behaviors that all learners must demonstrate prior to entering each phase of education.[54]

Physical therapy can benefit from communication across residency and fellowship programs and clinical specialties that explore the use of common values and core competencies that cross all specialty areas. Understanding more about these common values and core competencies can be helpful in guiding assessment. Also, as we learn and apply concepts from the other health professions to our own physical therapy competency framework, we must recognize the unique characteristics that differentiate the health professions from one another. In particular, physical therapy emphasizes the human movement and the movement system as an important component of health, whereas the other professions focus on different anatomical systems and aspects in the health care process.

Although both medicine and physical therapy have a similar purpose and outcome of residency education, that is, advanced knowledge and skills in a specialized field of training, significant differences exist between the 2 professions.[12,14,54] Medicine has a longstanding public recognition and expectation that physicians complete a residency as part of their mandatory entry into clinical practice. Few avenues exist for physicians to engage in clinical practice without residency. In contrast, in physical therapy, residency education has emerged as an entirely elective or optional route toward clinical specialization. Physical therapy, unlike medicine, does not benefit from government funding of medical residency and fellowship training following medical licensure.[58] For physical therapy, the lack of federally funded financial support for residency is an obvious practical deterrent for new graduates to pursue an extended educational experience. Other confounding variables that affect a physical therapist's decision to pursue postgraduate training include student debt after professional education and the realization that salaries have not demonstrated growth commensurate with specialization.

The physical therapy profession also faces both short-term and long-term strategic decisions about how to best approach the route to clinical specialization. The overarching question of whether there will be one path, or "gold standard," to achieve clinical specialization (ie, residency and fellowship training) or, as currently exists, multiple pathways that can lead to American Board of Physical Therapy Specialties (ABPTS) board certification in an area of specialization remains unanswered. The options have allowed for a variety of courses, certifications, and educational opportunities, often with inconsistent standards. Until the physical therapy profession adopts the educational progression of professional degree (doctor of physical therapy) through residency and fellowship as the expected route to advance from entry-level novice physical therapist to highly competent, specialized clinician, we will not see similar investment by universities and medical centers, or government funding support for development of residency and fellowship programs. Physical therapy may not be ready for such a path, however, recognizing the value of this postprofessional education will only be successful if the profession strives to improve quality by making timely, strategic educational decisions. We must decide for ourselves and invest now in developing educational processes that will build quality and consistency across residency and fellowship programs.

## A Working Framework for Physical Therapy: Future Considerations

A Residency and Fellowship Research Conclave was held in November 2013 to discuss educational strategic priorities for residency and fellowship research. Given the recent rapid expansion of residency and fellowship programs, the limited evidence of the effectiveness of this type of training, and the extensive competency frameworks for postprofessional education that exist, a group of interested educators and clinicians held a meeting to engage in dialogue about the future of residency and fellowship education. On a voluntary basis, 13 experts in residency and fellowship education from across the country representing orthopedics, pediatrics, geriatrics, neurology, manual therapy, and the ABPTRFE councils participated in the 2-day brainstorming conclave. When evaluating the educational frameworks used in residency education pathways in other health professions, a discussion concerning the vital elements of physical therapy residency and fellowship ensued.

There was agreement among all participants that a common, shared foundational platform of competencies or expectations is essential in any educational program design. The intention is not to be prescriptive but to allow for important shared understandings that are essential for ensuring consistency in standards for performance assessment. The group grappled with this question as a central focus: "How could common domains of competence across all physical therapy residency and fellowship programs drive the quality of current and future programs to ensure that the profession strategically develops programs that will meet the needs of society?" Instituting common competency-based domains for all physical therapy residencies with objective and measurable outcomes is not a trivial issue. The complex nature of competencies reflected in high-level syntheses of more operationally measurable learning objectives makes the task of developing and establishing common competencies challenging. Unlike residency programs in medicine, dentistry, and pharmacy, which have identified core competency domains across all specialty areas, physical therapy residency and fellowship programs have separate clinical competency statements and practice expectations seated within the DSP or DASP.[59–62] These competency documents, developed from a practice analysis conducted by each specialty area, guide curriculum, clinical practice breadth, components of advanced practice, and assessment for the residents and fellows in that specialty. These documents share some similarities in practice dimensions and terminology but these elements rapidly become outdated over the 10-year period when they are typically in place. Communication between APTA specialty sections does occur at the level of the ABPTS, but the specialty sections also have considerable autonomy, especially in the area of residency and fellowship education. Variable communication occurs between residency and fellowship programs in the same specialty area and across specialty areas. The ABPTRFE has begun to address this concern by the recent drafting of the DRP released to program directors.[15] These documents may contribute to more consistency across programs within the same specialty area.

## Proposed Common Domains of Competence in Physical Therapy

When evaluating each DSP, there are significant differences in terms of format and structure highlighted by examples from geriatrics and pediatrics.[13,63] However, there are also common areas of competencies that can be seen across the specialty areas. Each of the DSPs addresses the following major areas: practice dimensions, professional responsibilities, and knowledge areas and procedures expected of a specialist in the defined area.[13,63] Although there may not be perfect parallels, these areas of commonality could be viewed as the emerging foundation for shared competency domains across specialty areas. A major focus and outcome of the 2013 Residency and Fellowship Research Conclave was a working framework of 7 common competency domains for physical therapy residency and fellowship education (Fig. 2): (1) professionalism, (2) communication, (3) knowledge for practice, (4) clinical reasoning, (5) clinical skills, (6) inquiry skills, and (7) systems-based practice. As shown in Table 4, examples from the pediatric and geriatric DSPs have been used to illustrate how existing DSP documents may align with these proposed domains of competence in residency and fellowship education. Similarities in wording already exist in DSP documents, but agreement in the choice and use of language needs to be reached and integrated into common terminology. In Table 4, we also present examples of competency statements from EPAs of medical residency education to again


**Figure 2.**
Physical therapy proposed domains of competence.

demonstrate similarities in expectations that can make the development of core competencies achievable for physical therapy.[54,55]

## Implications

The growth of clinical specialization, advanced practice competencies, and residency and fellowship programs in the profession of physical therapy affords us the opportunity to be very intentional about building a continuum of learning that is developmental, robust, and focused on meeting our moral obligation to address the critical needs of society.[4]

Given the lack of a consensus-based shared framework of competencies within physical therapy residency and fellowship education to date, there continues to be potential for large variation of quality among accredited programs. Although the specialty areas will have some inherent variation given the differences in the health conditions and patient populations seen, there is an opportunity to combine resources with a shared platform of competencies for curriculum design.

The proposed domains of competence in this article may serve to theoretically ground all residency and fellowship programs and allow for more consistent assessment of these programs. This is not a "one size fits all" approach but rather an acknowledgment that a commonality, particularly around movement and function, exists across residency and fellowship education that can lay the foundation for all programs. As a profession, we have not yet fully embraced the concept of residency and fellowship education as the sole route for specialization. We may decide never to make this an exclusive path. The goal of providing "best practice" and ensuring optimal outcomes for our patients should always be paramount and drives us to establish a clear road map for accountability. This map should be grounded in common domains of competence with measurable objectives as the basis of residency and fellowship curricula and evaluation.[44]

## Ensuring Quality Standards

Several leaders in the profession have made clarion calls for transformative changes in physical therapy education at all levels.[4,20,23,64–67] These respected leaders have challenged the profession to work toward standardizing curricular competencies in physical therapy professional programs, intentionally developing the continuum of professional learning from undergraduate to professional education to postprofessional education, and addressing the changing landscape of societal need.[4,20,23,64–67] As professionals, we must be willing to assume the duties and obligations consistent with a doctoring profession.[4,20,23,64–67] A similar call for "standardization" is occurring in health care organizations to improve clinical effectiveness, safety, care experience for the patient, efficient use of resources, and equitable care and population health.[68] Patients want and expect a consistent care experience no matter where they receive their care within a health care system. The development of domains of competence for physical therapy residency and fellowship programs can move us toward the standardization and "consistency of optimal practice" that health care delivery demands.[69] Indeed, the challenge of creating, implementing, and measuring competence becomes even greater as we seek to establish a shared framework across the trajectory from professional (entry level) to postprofessional (residency and fellowship) education. We also must realize that a shared competency framework will not be without challenge, as well as opportunity, as a recent article in medical education referred to the competencies for medical residents—"Milestones or Millstones?"[70] A shared framework is an essential blueprint for consistency between curriculum and assessment of performance, but tension will remain in finding the right balance between assessment of more procedural competencies and the more contextual-bound qualities necessary for competent practice.[70,71]

## Next Steps: Is Now the Time?

The profession of physical therapy must continue to promote high-quality residency and fellowship curricula by preparing graduates in the core domains of competence. As medicine has already recognized, there is a need to focus on the developmental trajectory across professional and postprofessional education. A shared competency framework that begins in professional education and extends in postprofessional education will help facilitate learners at the highest levels of education and competence. We believe now is the time to evaluate and come to consensus on core domains of competence along the educational continuum. By raising our own bar toward a consistent level of curriculum development and assessment in residency and fellowship education programs, we will shape our profession to a place where and at a time when physical therapists are ready and prepared to meet changing societal needs. The ABPTRFE has recently convened an assessment task force to develop a standardized assessment tool for residency and fellowship education. This is an initial and essential positive strategic step forward.

## Conclusion

The profession is well positioned to take a critical reflective look at where we are, what we can learn from others, and how to best meet the needs of the patients and communities we serve. Growth of residency and fellowship programs is not nearly keeping pace with the demand. It is time to acknowledge the need for advancing residency and fellowship education both in number of programs and in an approach of consistency based on common domains of competence. We propose 7 domains of competence—pro-

**Table 4.**
Examples of Outcomes and Competencies Within Current Physical Therapy DSP Documents[a]

| Proposed Domains of Competence Across Residency/ Fellowship Programs | Link to Current Pediatric DSP Outcomes[13] | Link to Current Geriatric DSP Outcomes[63] | Potential EPA From Medicine Linked to Proposed Domains of Competence in Physical Therapy[54] (Column 1)[b] |
|---|---|---|---|
| Knowledge for practice | Evaluate the efficacy and effectiveness of examination tools, interventions, and technologies | Critically evaluate new information associated with geriatric physical therapy, including techniques and technology, legislation, policy, and environments related to patient/client care | Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment |
| Inquiry skills | Synthesize the current theory/ literature supporting the identified problem | Assess individual and collective outcomes of patients/clients using valid and credible measures that consider practice setting, patient/client culture, and effect of societal factors such as reimbursement | Locate, appraise, and assimilate evidence from scientific studies related to patients' health problems |
| Clinical skills | Procedural interventions are chosen and administered to minimize the impact of the environment on the efficacy of the intervention and to maximize the patient's/client's ability to function in the environment | Interact with patients, clients, family members, other health care providers, and community-based organizations for the purpose of coordinating activities to facilitate efficient and effective patient/client care | Organize and prioritize responsibilities to provide care that is safe, effective, and efficient |
| Clinical reasoning | Select and prioritize tests and measures based on history, systems review, scientific merit, clinical utility, and physiologic or fiscal cost to patient/client relative to criticality of data | Select and prioritize tests and measures based on history, systems review, scientific merit, clinical utility, and physiologic or fiscal cost to patient/client relative to criticality of data | Demonstrate an investigatory and analytic approach to clinical situations |
| Systems-based practice | Demonstrate prognostication by developing a plan of care that prioritizes interventions related to the recovery process, patient/client/family goals, resources, health and wellness, and federal guidelines | Maintain current knowledge base regarding current health indicators as identified by the Department of Health and Centers for Disease Control and Prevention in order to provide education to the patient, caregivers, health professionals, and the public on the role of physical therapy intervention | Continually identify, analyze, and implement new knowledge, guidelines, standards, technologies, products, or services that have been demonstrated to improve outcomes |
| Communication | Use patient-first, respectful language during communication | Respectfully communicate with patients/clients, family, caregivers, practitioners, consumers, payers, and policy makers | Counsel and educate patients and their families to empower them to participate in their care and enable shared decision making |
| Professionalism | Establish trustworthy relationships with colleagues, patients/clients/families, employers, and the public | Assume an advocacy role by attempting to make the health care delivery system more responsive to the needs of elderly patients/clients | Demonstrate accountability to patients, society, and the profession |

[a] DSP=*Description of Specialty Practice*, EPA=entrustable professional activity.
[b] Examples of competencies within medicine required for all residency programs across specialty areas.

fessionalism, communication, knowledge for practice, clinical reasoning, clinical skills, inquiry skills, and systems-based practice—as a working framework for all residency and fellowship programs. We believe that agreement on key domains of competence is necessary if we expect high levels of clinical performance leading to recognized specialization through postprofessional residency and fellowship education. The competencies also provide a foundation for

learning across the educational trajectory, beginning in professional education and extending into postprofessional education. This framework serves as a basis for physical therapists and the profession of physical therapy to meet the expectations of high-quality care as we transform society through movement and function.

All authors provided concept/idea/project design, writing, and review of manuscript before submission. Dr Furze provided project management.

The authors acknowledge the Residency and Fellowship Research Conclave participants who contributed to the concepts in the manuscript, including, Diane D. Allen, J.B. Barr, Lisa Black, Matt Briggs, Nicole Christensen, Terry Ellis, Joseph Farrell, Judy Gale, Greg Hartley, Becky Olson-Kellogg, Raine Osborne, Erica Sigman, and Julie Whitman.

DOI: 10.2522/ptj.20150473

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## Appendix.

History of Residency and Fellowship Education

Physical therapists' first foray into postprofessional formal education experiences not designed solely around clinical skills or around an additional degree may have been in the 1960s when they joined in the interdisciplinary postprofessional training experiences in pediatrics established by the network of University Affiliated Programs–funded training grants under the Health Resources and Services Administration (HRSA).[72] During the 1970s, a growing number of physical therapists traveled across the United States and the world seeking advanced training experiences through opportunities that included close clinical observation and mentoring with recognized "expert" clinicians. Some physical therapists sought the guidance of the Bobaths and of Rood and Voss, and still others were on a quest to improve manual therapy skills by traveling and spending time in Australia, New Zealand, or the Scandinavian countries.[23]

The first physical therapy residency was developed in the late 1970s in California as the need for advanced clinical competence in orthopedic physical therapy was addressed through postprofessional education centered on clinical performance.[22] The American Academy of Orthopaedic Manual Physical Therapists (AAOMPT) was the first organization to both establish standards and create a recognition process for manual therapy postgraduate programs, referred to at that time as manual therapy residencies.[25,73] The AAOMPT curriculum standards (1993) were based on standards developed by the International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT).[25]

In 1994, the American Physical Therapy Association (APTA) established a task force on the accreditation of clinical residencies, charged to develop recommendations for the accreditation of residency programs. From the work of this task force and their suggestions, the APTA Board of Directors voted in 1996 to implement a voluntary credentialing process for postprofessional clinical residency programs.[22,74] Within 1 year, the Committee on Clinical Residency Program Credentialing was established and charged with oversight of a new credentialing process for residencies.[26] Later (in 2009), this committee transitioned into the American Board of Physical Therapy Residency and Fellowship Education (ABPTRFE). The term "credentialing" was selected based on the scope of the review process during these early stages of development, but in 2014, the term "credentialing" was officially replaced by the term "accreditation" by ABPTRFE when referring to the process by which programs (residencies or fellowships) are recognized as having met the criteria and requirements.[12,26]

Residency programs have been aligned with the specialty areas identified by the American Board of Physical Therapy Specialties (ABPTS) and have been based on the same Description of Specialty Practice as the clinical specialist examination in the specific area of physical therapy.[21] In 2000, the credentialing of subspecialty areas identified as fellowships was initiated. In 2001, APTA merged its credentialing process with the AAOMPT's recognition of orthopedic manual physical therapy programs.[75] In a similar fashion, the Sports Physical Therapy Section and APTA merged their credentialing process for sports residencies in 2004 while the number of residencies and fellowships continued to grow across the country. As described above, the Committee on Clinical Residency and Fellowship Program Credentialing became ABPTRFE in 2009.[75] The ABPTRFE expanded the infrastructure to include a 7-member board with 2 councils and their respective committees, an Accreditation Council and a Program Services Council. The ABPTRFE determines the requirements necessary for accreditation of clinical and nonclinical physical therapy residency and fellowship programs.