Pharmacy residency and the medical training model: Is pharmacy at a tipping point?

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The American College of Clinical Pharmacy (ACCP) and the American Society of Health-System Pharmacists (ASHP) each have established a vision that, by 2020, postgraduate year 1 (PGY1) residency training should be required for entry into practice for all pharmacists who will serve in direct patient care roles.¹,² In 2008 and 2009, published analyses of residency program numbers and workforce implications estimated that annual growth of about 17% in the number of PGY1 residency positions is needed to ensure that the profession can train enough pharmacists to meet the 2020 goal.³,⁴

Now 2020 is less than a decade away. In recent years, the economy has undergone significant upheaval, health care reform legislation has been enacted, several new schools of pharmacy have opened, and student enrollments have increased. Consequently, the pharmacy profession continues to examine the best approach to redesigning pharmacy practice models to accommodate the growing clinical roles of pharmacists through efforts such as the ASHP Pharmacy Practice Model Initiative.⁵ These are among the many changes affecting pharmacy workforce demands and projections, particularly in regard to residency training.

In light of these changes, this article is intended to stimulate discussion and action to increase the nation’s capacity for residency training. Current statistics and a review of the history of the medical residency system will be provided, with insights on lessons learned from the medical profession that may have implications for pharmacy residency expansion and development. Recommendations will be provided to guide consideration of ways in which pharmacy can best bring resident training to a “tipping point”—the point at which the profession can create a significantly larger number of residency positions by 2020.

Why will so many more residency-trained pharmacists be needed? The pharmacy workforce demand picture appears to be substantially different now than it was just two to three years ago. In June 2007, the Aggregate Demand Index (ADI)—a broad indicator of the nationwide pharmacist supply and demand reported by the Pharmacy Manpower Project—was 4.13, indicating a significant shortage of pharmacists relative to positions available.¹ In July 2010, the ADI had dropped to 3.37 in all practice settings nationwide, to 2.85 in community practice settings, and to 3.8 in institutional practice settings; those numbers indicate a better balance of supply and demand of pharmacists today, as compared to the significant shortage the data indicated three years previously. One must keep in mind that the recent economic downturn may have had an impact on the availability, and even growth, of new pharmacist positions. The most recent Bureau of Labor Statistics data indicated there were 267,860 employed pharmacists in 2009; the data show 177,720 (66.3%) were employed in the retail or community sector, 67,850 (25.3%) in health systems, and the remaining 22,290 (8.3%) in other positions that are generally not considered direct-patient-care positions.⁷ As of the fall of 2010, the Accreditation Council for Pharmacy Education website listed 120 accredited, candidate, or precandidate schools and colleges of pharmacy; the American Association of Colleges of Pharmacy website listed total first-professional-degree
enrollment of 54,710 students as of the fall of 2009 (or about 13,700 students per year of pharmacy school). This compares to 48,500 students enrolled in the fall of 2006, which is an increase of about 12%. Figure 1 illustrates the growth in the number of pharmacy students since 1990. The number of graduates continues to grow, despite a recently decreasing demand according to the ADI.

Longitudinal data on residency positions and results of the annual ASHP Resident Matching Program (the Match) are shown in Figure 2. From 2007 to 2010, growth in the number of applicants for PGY1 pharmacy residencies was much faster than the increase in available positions (Figure 3). The gap between residency demand and supply continues to widen, despite recent growth in the number of available positions. Such growth rates are not keeping up the pace with the 17% annual growth rate that is considered necessary to ensure that all pharmacists entering direct-patient-care roles by the year 2020 will have completed at least one year of residency training. If the 2020 goal is to be achieved, each year that passes with a lower than needed growth rate will further increase the need for more rapid expansion in the future. With the current easing of overall demand for pharmacists, the next few years may be an ideal time to achieve a dramatic increase in the number of residency positions. By delaying entry into the profession, the influx of graduates into training programs would seem to have a short-term positive effect on a workforce that appears to be entering a time of adequate overall supply of pharmacists. While that will only delay pharmacy school graduates’ entry into the workforce by one or two years, the increase in residency slots would result in a more highly trained and skilled workforce ready to assume an expanded role in direct patient care.

To our knowledge, there are no recent studies to better define the demand for pharmacists with postgraduate training in either generalist or specialist roles. In 2004, ASHP conducted a survey to determine if health systems were requiring specialized residency training—now known as postgraduate year 2 (PGY2) residency training—for clinical specialist positions; 15% of the respondents indicated that such specialized training was required, and 67% indicated that a lesser-trained pharmacist would be hired to fill a clinical specialist position only if a candidate with specialized training could not be found. When asked about the difficulty of filling clinical specialist positions, 52% of the respondents to the 2004 survey strongly agreed that it was difficult.

Figure 1. Growth in number of U.S. pharmacy graduates over time. Projections from the Accreditation Council for Pharmacy Education (ACPE) are calculated using actual enrollment data published by the American Association of Colleges of Pharmacy and estimated rates of attrition based on historical norms. Reproduced with permission of ACPE.
to fill such positions due to a shortage of qualified applicants; today that figure might be lower because of changes in the economy and an increase in PGY2 residency positions over the past seven years. In the current environment, health systems might be able to demand PGY1 and PGY2 training and be more successful in hiring individuals with that training (Figure 4).

Currently, the majority (92%) of residency programs are still run by hospitals and health systems, and the majority of pharmacists completing residencies continue to enter health-system positions, in both acute care and ambulatory care roles. If an increase in demand for residency training in community practice settings is stimulated by the continued evolution of pharmacy practice models, community pharmacies might be ideally positioned to help meet that demand by creating more residency positions in community settings. Moreover, it is possible that the demand for new pharmacy positions will grow in the areas of acute care and, more notably, ambulatory care due to health care system changes in the years ahead, including changes mandated by legislation (e.g., evolution of the medical home care model, growth of “accountable care organizations”). For now, it appears that employers can begin shifting to the more proactive position of requiring PGY1 or PGY2 training, as the number of individuals seeking and completing pharmacy residencies continues to increase. At this time, it appears that there is demand for more residency-trained pharmacists and that the profession needs

Figure 2. Data for ASHP Resident Matching Program (postgraduate year 1 programs), 1990–2010. Average annual growth 2007–10: applicants, 17.8%; positions, 7%; matched, 11.4%. Based on internal data, Accreditation Council for Pharmacy Education (2010 Aug 4). Used with permission.
to expand the number of residency positions to meet the demand.

What other model of residency expansion might hold lessons for pharmacy? Assuming that programs such as the ASHP Pharmacy Practice Model Initiative will help establish pharmacy as a profession primarily focused on direct patient care, ways to rapidly expand pharmacy residency programs must be identified to ensure that the profession is able to meet its own goals. The medical residency training model is the most obvious example to explore, simply because the residency model of training essentially originated in the field of medicine. The modern American concept of a formal medical residency was introduced at Johns Hopkins Hospital in 1899. A resident was described as a physician who had completed an internship and was continuing hospital-based training to acquire expertise in a specific area of medical practice. As originally conceived, residencies were intended to train medical practitioners to serve as investigators and teachers in a specialty area. It was not until the 1960s that all medical school graduates were required to complete

![Figure 3. Unmatched applicants and positions for postgraduate year 1 pharmacy residencies. Arrows represent slopes. Based on internal ASHP data on Resident Matching Program. Used with permission.](image)

![Figure 4. Graduates of ASHP residencies 1964–2009. The types of available residencies have changed over time. Based on internal ASHP data. Used with permission.](image)
residency training. The number of medical residency positions grew from 5,796 in 1940 to 46,258 in 1970, an average annual growth rate of about 7.2%. However, that growth does not appear to have occurred at a steady pace.

According to Ludmerer,12 medical training in the 1940s was primarily the realm of universities and affiliated hospitals. The medical students provided additional patient care coverage while in training at university hospitals, and faculty members soon realized they could be freed up to do more research or teaching or attend to their patients by increasing the number of residents and by using the more senior medical students to teach the junior medical students. Hospitals learned that increasing the number of medical residents conferred economic benefits by increasing services and coverage of their patients, whose care was becoming more complex with advances in medicine. Hospitals eventually began to expand the role of medical residents to include ambulatory care clinics. The large increase in specialization and residency programs in medicine began after World War II, as many physicians returned from the war with "GI Bill" benefits to cover education; many envisioned larger potential earnings through specialization, and they needed medical residencies to move into specialized areas of practice. The increased demand for residencies, coupled with university hospitals' increasingly positive view of residency programs, led to the creation of more residency positions. Over time, more medical students pursued specialized training, and the growing medical residency system helped to advance medical education, faculty research, and patient care at the medical centers—a "win–win" for everyone.

In addition to the significant growth and transformation of training, specialization, and health care in general during the postwar decades, the introduction of Medicare in 1965 codified federal reimbursement of the costs of the training of residents by health care faculty and facilities. University and community hospitals increased the number of residency positions and even recruited foreign medical graduates to help fill the new residency positions created.

Do we now face a similar transformation of the pharmacy profession? The complexities of contemporary medication regimens have fueled the need for the pharmacy profession to radically increase the number of residency positions to help provide adequate medication-use coverage for patients and ensure adequate training for the next generation. While a transformational event comparable to World War II is unlikely, pharmacy students’ demand for residency training has already increased substantially and rapidly. Twenty years from now, will the pharmacy profession look back and see the current health care reform movement—whatever path it ultimately takes—as a key impetus for a dramatic increase in residency positions? The formation of accountable care organizations pursuant to the major health care reforms enacted in 2010 may create a significant demand for pharmacists similar to the increased demand for physicians with the advent of Medicare. The convergence of increasingly complex medication regimens, health care reforms, professional policy initiatives, and rising student demand for residency training seems to have placed the pharmacy profession at a critical juncture similar to the one the medical profession navigated 50 years ago.

Can organizational leaders be convinced that increasing residency positions can help provide needed services for patients? Pharmacy leaders need to step up efforts to show how more pharmacy residents can improve the quality, quantity, and consistency of patient care services by increasing the availability of pharmacists in the hosting institutions' facilities. Pharmacy leaders need to be more aggressive in marketing the value that pharmacy residents bring to the organization. Increased exposure to the pharmacy resident and education of key decision-makers on the value of residency expansion also might help increase the demand for more residency-trained pharmacists in the organization.

The pharmacy profession may want to be careful not to follow the medical model too closely: Many would argue that the field of medicine has become overspecialized. Can pharmacy find a way to avoid a similar situation? Perhaps the value offered by pharmacists will be fully realized, and that will translate into a significant increase in the demand for a variety of specialty practices. The profession should try to guide the development of the skill sets required within the workforce to provide the most appropriate care based on patient needs. The collaboration of pharmacy’s leading professional organizations in the Pharmacy Manpower Project may be a place to begin to determine needs based on predicted patient demands into the future.

Are we nearing a tipping point for pharmacy residency training? Based on Gladwell’s book,13 the phenomenon of the tipping point could be described as a convergence of opportunity and demand that influences an entire culture. The tipping point for the expansion of medical residency training seems to have been a perfect confluence of demand by hospitals, a need for increased patient care, increased patient complexity, and improved funding, as well as an increased demand by medical students for residency and specialty training. Three years ago, ASHP’s president called on the Society’s membership for ideas and actions to speed the arrival of pharmacy’s tipping point.14 Perhaps the tipping point is already here, right now.
Currently, there appears to be a convergence of opportunity and demand that might serve as the tipping point for expanding the ranks of residency-trained pharmacy practitioners. There is already demand from pharmacy students to complete residencies. Pharmacy organizations have gone on record as supporting the expansion of residency-trained individuals to fuel the demand side to help advance the service pharmacists provide in the health care system.1,2 There is certainly demand from hospitals to provide more and increasingly complex pharmacy care at reduced costs while also improving health outcomes. Increasing the number of residency positions could help provide more pharmacy services to more patients in a more economical manner while providing an excellent learning opportunity for trainees. Residents can provide an increased pharmacist presence within an institution or clinic; that in turn will create a more informed public perception and increased awareness of the pharmacy practitioner, generating even more demand by health systems for that presence, similar to the demand that spurred the expansion of the medical residency system. Unfortunately, inadequate funding for both pharmacy services and residency programs continues to be a major perceived barrier to the expansion of residency opportunities. Funding for hospital-based residencies from the Centers for Medicare and Medicaid Services (CMS) and several grant programs help, but programs may need to focus on other values afforded the organization by offering residency programs or additional positions, as elaborated in a recent ACCP white paper.15

Can the current pharmacy residency model accommodate increased training needs? Currently, the average number of residency graduates per program is 2.6 for PGY1 programs and 1 for PGY2 programs (Internal data, Accreditation Services Division, ASHP, 2010 Aug 4). This compares to 6.3 for general practice (core) medical residency programs and 1.9 for subspecialty medical residency programs16; those numbers suggest that there is room for expansion within the pharmacy residency model—to at least provide an adequate supply of residency-trained pharmacists for hospital positions (only 25% of current pharmacy practitioners work in hospitals and health systems). However, pharmacy residents most likely will be trained in settings that are most consistent with their desired career path, in which case the number of community practice-oriented residencies will need to be increased significantly. In particular, it appears that a large area of potential growth in patient care services is in the ambulatory care and community practice settings.

In 2010 there were 64 community-pharmacy residency programs in the accreditation process that offered 117 positions, and 93 of those positions were filled in the 2010 Match.17 There seems to be a need to develop a significant number of community and ambulatory-care pharmacy residencies; however, without a new financial model for payment of pharmacists’ services, this development has been challenging.

What can be done to prepare for the tipping point? To help develop programs in community and ambulatory-care practice settings, health systems that have experience with pharmacy residency programs should look for opportunities to engage pharmacists and pharmacy residents as part of accountable care organizations, within outpatient clinics and medical homes, or look for grants offered to community care centers for underserved areas. Expansion into these areas will help meet patient needs while helping to demonstrate the value of pharmacists in these positions. Schools of pharmacy should continue to support the development of new community pharmacy residencies. Community pharmacy residency program directors and trainees should conduct projects that demonstrate that the clinical services provided by residents contribute to the success and profits of the organization while providing needed service to the community.

Only the pharmacy profession can guide the development of new residency programs. Leadership by a variety of pharmacists in multiple positions will be needed to help advance the agenda for the expansion of residency positions. All residency-trained individuals will need to assume responsibility to help these programs develop and expand. To ensure success, the development of these positions should go hand in hand with efforts to advance the quality of patient care. Professional organizations can convene conferences and set direction, but it is even more important for institutions, health care organizations, and individual pharmacists to take responsibility for creating a system in which expanded residency positions and patient care services are developed to meet needs at the local and regional levels. Funding will almost always be a significant issue for all training models to overcome. Pharmacy leaders will need to increase their visibility in documenting how residency programs help improve patient care and reduce overall health care costs. As the government works on ways to reward health systems that achieve better outcomes and reduced readmission rates, pharmacy will need to make sure residents are involved in projects and their contributions showcased to upper management to market the value of these programs and services; the profession will also need to educate residents on the importance of marketing their impact on patient care and the financial viability of their services.

The profession must remain actively engaged in health care reform.
and ensure that pharmacists and residents seek out opportunities to be part of new health care models. A variety of reimbursement models could develop, and the profession needs to be prepared to identify how residency positions can help support each model. If pharmacists are finally recognized as “health care providers” eligible to bill CMS directly for their services, and direct pharmacist patient care becomes a “revenue generator” rather than a “cost center,” this may help expansion of more clinical functions and support the creation of more residency positions. Perhaps increased reimbursement for these services will finally be the tipping point needed for both pharmacists and residencies in the community setting to provide additional pharmaceutical care. Community pharmacies are beginning to experiment with new models to increase the work pharmacists are doing with medication therapy management, and residencies can help develop these programs.17

Within hospitals, pharmacists have traditionally not been concerned with ensuring appropriate documentation for payment for clinical services, but in newer models this may be more important and should be addressed. Ambulatory-care pharmacists have been documenting to support “incident to” billing, facility fees, and other forms of cognitive services billing, but a change such as this would definitely require a culture shift. This may also change the approach that pharmacists take in prioritizing daily activities and delivering care. The profession should begin preparing for this and focus on ensuring appropriate documentation in the official medical record.

Pharmacists need to step up to provide the services that clearly are best provided by a pharmacist. As more pharmacists complete residencies, their personal expectations as well as their employers’ expectations will continue to advance. Pharmacy leaders need to ensure pharmacists’ jobs maximize the use of their training. Practice models should be carefully examined to ensure that pharmacists are not used for technical functions that should be delegated to pharmacy technicians or performed by automation systems. This may require careful self-examination of pharmacist expectations, and new models might be quite different than those envisioned 5–10 years ago. Advanced decision-support systems can now make recommendations pharmacists made in an earlier era, or perhaps another health care professional in a team may be more appropriately suited and more economical to perform certain functions. Pharmacists and residents must make sure they are benefiting multidisciplinary teams to improve patient care in an efficient manner through skills only they can provide.

As pharmacists’ clinical responsibilities continue to evolve, the profession must support the training of qualified pharmacy technicians, who should be required to complete a nationally recognized, standardized, accredited training program and complete a nationally recognized credentialing process. By ensuring standardized training and credentialing, the profession can maximize the support pharmacy technicians provide to pharmacists.

One way the profession could actually expand services is by increasing the number of residents, as occurred in medical residency history: Provision of more physician services in hospitals created demand for medical residents in medical clinics, which, in turn, became the next point of expansion. It may be time for the profession to be more assertive in expanding residency programs beyond hospitals to include more ambulatory clinics, medical homes, community care centers, and other areas throughout the health care system. This expansion will improve patient outcomes and increase demand for even more pharmacists in the future.

Because pharmacy does not have as complex a residency model as our medicine colleagues—one with multiple tiers of residents and fellows that consistently allows for senior residents’ involvement in training junior residents and students—the profession should identify more opportunities to engage PGY2 residents to train PGY1 residents or pharmacy students in advanced pharmacy practice experiences, and to engage PGY1 residents to train pharmacy students in introductory pharmacy practice experiences (perhaps even some advanced pharmacy practice experiences), as has been proposed by some parties to improve the profession’s capacity to adequately train all of these individuals.18 As residency positions expand, they may be able to help address the increasing need to provide more student rotations and training, instead of being seen as competing for demands on the pharmacy staff.

**Final notes.** It appears that pharmacy may be at a tipping point—a critical juncture at which a growing number of hospital or health-system pharmacist positions require residency training to accommodate new service models and there is a need to expand the nation’s capacity to train pharmacy residents in order to meet the increased demand. Some lessons can be learned from the history of the medical residency system and should be considered as the pharmacy profession moves to support growth in the number of pharmacy residency positions that is adequate to meet the current and projected demand. Pharmacists should take a strong leadership role in that process to ensure that health systems view the value of the pharmacy resident within an organization in the same way they view the value of the medical resident. With ongoing change in health reform and the economy, the profession should view the present
time as an opportunity to advance the number of residency positions. Addressing these challenges now can ensure that the pharmacy profession can meet the 2020 training challenge and play an increasingly vital role in patient care and medication management in the decades ahead.

References