Pharmacy technicians, supporting our past, shaping our future: Implementing an ASHP-ACPE–accredited pharmacy technician training program in an academic medical center

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Purpose. Pharmacy technician training and education vary depending on practice site and state law. Although technician certification provides a national standard for credentialing, not all states require it, making certification a voluntary process for technicians or the organizations employing them. As the role of the pharmacist has evolved, the need for highly trained pharmacy technicians has grown. The pharmacy technician's expanded role in specialized areas of pharmacy practice has created new opportunities that require advanced training.

Summary. Research is lacking on return on investment for workforce development programs, making it difficult to advocate for pharmacy technician training programs. Therefore, it is important to create internal metrics that link one's program to business performance. This begins with conducting a job market analysis for the geographic area. It is imperative to identify the current occupational outlook for pharmacy technicians, identifying areas with potential for growth as well as where there are shortages or high turnover. Successful development of an American Society of Health-System Pharmacists (ASHP) and Accreditation Council for Pharmacy Education (ACPE)–accredited pharmacy technician program requires a long-term strategy to address key market issues as well as social and economic barriers and financial data to secure funding.

Conclusion. This case study details Yale New Haven Hospital's journey from proof of concept to implementation of an ASHP-ACPE–accredited pharmacy technician training program.

Keywords: pharmacy administration, pharmacy advancement, pharmacy education, pharmacy technicians, vocational training, workforce training and development

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Yale New Haven Hospital (YNHH) is a 1,500-bed academic medical center in New Haven, CT. As is the case in many academic medical centers, the pharmacy technician's role has evolved owing to the increased role of pharmacists in improving patient outcomes.[1] As a result, the demand for highly trained pharmacy technicians has grown significantly over the past several years. Technician responsibilities have expanded into the areas of sterile preparation of nonhazardous and hazardous medications, medication histories, quality improvement, value-based purchasing, supply chain, and 340B, as well as specialty roles in informatics, procedural areas, pediatrics, oncology, genomics, specialty pharmacy, and investigational drugs—creating novel opportunities that require advanced training.

Education and training of pharmacy technicians vary depending on practice site and state requirements.[2] Although pharmacy technician certification

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provides for a national standard, not all states require it, making certification a voluntary process on the part of the technician or the organization by which they are employed. Taking the lead from the American Society of Health-System Pharmacists (ASHP) Practice Advancement Initiative (PAI), many academic medical centers have taken it upon themselves to develop their own accredited training programs. These programs seek to provide an organization with a viable pool of highly trained pharmacy technicians for hiring, to allow pharmacists to take on direct patient care activities. ASHP PAI 2030 recommendations emphasize the need for all newly hired technicians to have completed an ASHP and Accreditation Council for Pharmacy Education (ACPE)–accredited technician education and training program.[3,4]

In occupational outlook information from the Bureau of Labor Statistics of the Department of Labor, the demand for pharmacy technicians is projected to grow nationally by 12% through 2026, faster than the average for all occupations.[5] The US News & World Report 2021 list of best healthcare support jobs ranks pharmacy technician as 21 out of 30, with 15,200 projected new jobs by 2029.[6] Many factors influence the current pharmacy technician labor pool for an organization. At YNHH, these include the current occupational outlook in the state of Connecticut, public knowledge or visibility of the role of an institutional pharmacy technician, requirements for hire such as a high school diploma or general educational development (GED) test, and prior work experience as a pharmacy technician. In line with recent statistics, YNHH has experienced significant growth in the technician workforce owing to expansion of oncology and specialty pharmacy outpatient services, addition of a technician-driven medication history program, and creation of a standalone children's hospital pharmacy. The calendar years 2015 to 2017 saw a 33% increase in growth for pharmacy technician positions. With most new positions going to experienced internal candidates, the hospital was compelled to backfill critical inpatient operations positions with external candidates who lacked prior hospital experience. Over the 3-year period, YNHH averaged 33 open positions per year. For every position posted, we receive 5 external applications, of which 2 meet our minimum department requirements for an interview (1 year of hospital pharmacy experience and national certification). Over the same time period, over 95% of external candidates interviewed came from the community pharmacy setting and lacked the advanced skill set for institutional pharmacy practice. Moreover, on-the-job training for these new hires generally took between 6 and 8 months. In 2013, Deloitte estimated that an average employee's value to an organization ranges from tens of thousands of dollars to 1.5 to 2 times their annual salary.[7] Disruption due to vacancy dramatically impacts productivity through loss of the experience, cohesiveness, and skills of the transitioned employee. With a higher-than-average turnover, the cost of vacancy can be a significant burden. Therefore, performing a job market analysis for your region and calculating the cost of your existing vacancy rate will help determine the actual business impact of talent shortages.

During this period, a review of the labor budget for pharmacy technicians revealed that the hourly regular salaries were under budget, resulting in a shift in salaries expense to the overtime line. A deeper dive into the overtime salary expense revealed that technicians were working overtime, not only to fill open shifts created through attrition, but also to onboard new staff. Tracking cost per hire and time to hire provides vital information when building a business case for a technician training program.

Recognizing that external opportunities for education and training of health-system pharmacy technicians in the state of Connecticut are uncommon, YNHH set out to prepare prospective candidates for a sustainable health-system pharmacy technician career path. We created a business plan for an ASHP-ACPE–accredited pharmacy technician training program with the purpose of fulfilling our need for standardized education and training, creating a qualified pool of career-minded candidates for hire, and containing overtime spending due to staff vacancies and new employee training.

Identifying social and economic barriers

Much has been written regarding workforce development and barriers to entry into the labor force. These barriers include, but are not limited to, education and skills, dependent care, transportation, salary, and the reluctance of a current employer to accommodate one's educational endeavors.[8] For most, a high school diploma is no longer sufficient to gain employment with higher-paying jobs, making postsecondary education, such as certificate programs, an appealing option.

KEY POINTS

- There is a need for standardized education and training of pharmacy technicians in the acute care setting to support pharmacy technician growth and practice advancement.
- Creation of an American Society of Health System Pharmacists and Accreditation Council for Pharmacy Education–accredited pharmacy technician training program is a means of generating a viable pool of qualified candidates for hire.
- Implementation of a hospital-based pharmacy technician training program should include an analysis of revenue and cost avoidance opportunities. Program outcomes may also include reduction in time to hire and training time.

In 2004, the concept of the "living wage" was first developed.[9] Estimating the cost of food, childcare, healthcare, housing, transportation, taxes, and other basic living necessities by geographic region, the living wage represents the minimum wage required to meet basic individual needs with a modest standard of living.[9] A comparison of pharmacy technician salaries to the regional living wage provides some clarity to the current shortage. For example, in Connecticut, the living wage for a single person is $13.22/hour whereas the living wage for a person with 1 child, commonly referred to as the family wage, is $28.34/hour. According to the Bureau of Labor Statics, in the Northeast, the average salary for a pharmacy technician is $16.35/hour.[5] For a single parent wishing to pursue a career as a pharmacy technician, a wage of $16.35/hour is well below the projected family wage of $28.43/hour for the state of Connecticut. Current wages for pharmacy technicians in the state of Connecticut and nationally represent a barrier to recruiting and retaining pharmacy technicians.

In addition to salary, for sustainable student enrollment, it is important to recognize that tuition fees for an ASHP-ACPE–accredited pharmacy technician training program can vary depending on the organization, ranging from $1,500 to $5,000.[10] Program length varies from 15 to 20 weeks. At YNHH, to meet our financial responsibilities, tuition was set at $3,350 for a 20-week program. For prospective students, tuition may present a barrier to enrollment. Unfortunately, federal student loan assistance is not available, as our hospital-based program is not considered an eligible educational institution by the Department of Education.[11] Therefore, proactively identifying alternative channels for tuition assistance is necessary. Following establishment of the training program and identification of these potential financial barriers, YNHH began offering several options to prospective students for tuition payment, which include a hiring bonus equal to tuition and tuition reimbursement for hospital employees who matriculate into the program. Additionally, a partnership with the Workforce Development Program of the state of Connecticut has created a pathway for students to obtain state and federal funds for tuition assistance (and contributed to program recruitment).

Along with addressing tuition funding, it is most important to garner buy-in from hiring managers as it relates to skills readiness. Managers can hold diverse views on employment readiness. A 2012 McKinsey survey looking at the global crisis of youth unemployment (defined as unemployment of 15- to 24-year-olds) revealed that 45% of US employers say a skills shortage is the leading reason for entry-level vacancies.[8] Hiring managers have a tendency to select candidates who are equivalent to their current staff. At YNHH, prior experience as a pharmacy technician is required for hire. We have found that students from the training program lack relevant work experience. However, we speculate that graduates of a training program have the potential to bring a broader view of pharmacy practice. Hiring students from the program can lead to environments rich with diversity, questioning attitudes, and new perspectives. Engaging managers in the student selection process for admission to the program has gone a long way toward overcoming perceived gaps in employment readiness for graduating students.

Additionally, the journey from the classroom to employment can be challenging for any student without prior work experience if skills development only focuses on technical skill sets. Engaging managers in a preprogram boot camp focusing on diverse topics such as leadership skills, dressing for success, and professional behavior helps to create a sense of unity. We have found it beneficial to address the social and emotional skills needed to succeed in the workplace and to aid students in identifying their strengths and gaps early on. In our opinion, this shared accountability model creates a sense of community and allows managers to engage faculty to drive curriculum and identify candidates for interviews early on in the process. As we balance the shortage of pharmacy technicians and the shortage of varied skills necessary to perform in the workforce, identifying what management measures as success has been essential to the achievement of students as they enter rotations and seek employment.

Turning the value proposition into a business plan

The foundation of this business plan comprises our vision, defining our uniqueness and value, as well as sustainability and growth potential. Numbers used in this plan were obtained from publicly reported salary data from the Bureau of Labor Statistics.

This 5-year business plan was written to cover the startup costs of the program as well as anticipated ongoing expenses. These included an initial ASHP-ACPE accreditation application fee, annual assessment fees, program coordinator salary, program marketing and recruitment, classroom equipment and supplies, student background checks, the cost of Pharmacy Technician Certification Exam (PTCE) registration, and other miscellaneous expenses. Overall, implementation of the pharmacy technician training program carried an expected total cost of $1,076,060 over a 5-year period (Figure 1). The largest expense of the training program was associated with hiring a manager to oversee training and education and an experienced pharmacy technician as a full-time program coordinator.

Costs for the coordinator and teaching content of the program during the first 6 months of the program were absorbed using existing pharmacist and technician staff as well as pharmacy students and residents. In year 2, a manager position was deemed necessary to oversee all pharmacy technician education and training in the department. In addition to the training program, this manager would also direct

Figure 1. Program business plan with sample calculations. [a]Assumes an annual salary of $128,090 for a pharmacist (Bureau of Labor Statistics). [b]Assumes an annual salary of $61,210 for a program coordinator (Bureau of Labor Statistics). [c]ASHP-ACPE application and annual assessment fees. [d]Assumes 15 students for year 1 and 26 students per year thereafter. [e]Tuition of $3,350 per student. [f]Assumes median pharmacy technician wage of $16.32 in Connecticut in 2019.[5] [g]Time and a half for overtime. [h]Average vacancy of 10 full-time equivalents. [i]Assumes 12 weeks of reduced vacancy time. [j]Assumes 8 weeks of reduced training time. FTE indicates full-time equivalent.

EXPENSES	Year 1	Years 2-5	Total for Years 1-5
# Students per Year	15	26	
Manager, Technician Training and Education ($)			
Salary (1.0 FTE)[a]	0	512,360	512,360
Benefits/Nonproductive Time (30% of Salary)	0	153,708	153,708
Coordinator, Technician Training Program ($)			
Salary (1.0 FTE)[b]	30,605	244,840	275,445
Benefits/Nonproductive Time (30%)	9,182	73,452	82,634
Sub-Total (Salary and Benefits Expenses) ($)	**39,787**	**984,360**	**1,024,147**
Accreditation Application Fee[c]	660	0	660
Accreditation Annual Assessment Fee[c]	0	11,200	11,200
Program Marketing	1,000	4,000	5,000
Simulation Equipment	5,000	1,200	6,200
Simulation Supplies	600	6,000	6,600
Candidate Background Checks ($58 per)[d]	870	6,032	6,902
Pharmacy Technician Certification Exam ($129 per)[d]	1,935	13,416	15,351
Sub-Total (Classroom Expenses) ($)	**10,065**	**41,848**	**51,913**
Total Expected Expenses	**49,852**	**1,026,208**	**1,076,060**

REVENUE ($)	Year 1	Years 2-5	Total for Years 1-5
Total Expected Tuition[d,e]	**50,250**	**348,400**	**398,650**

COST AVOIDANCE ($)	Year 1	Years 2-5	Total for Years 1-5
Annual Coverage of Vacancies[f,g,h,i]	117,504	470,016	587,520
Coverage for Traditional Training[f,g,h,j]	78,336	313,344	391,680
Total Expected Cost Avoidance	**195,840**	**783,360**	**979,200**
COST AVOIDANCE + REVENUE ($)	**Year 1**	**Years 2-5**	**Total for Years 1-5**
Total	**246,090**	**1,131,760**	**1,377,850**

BOTTOM LINE: [(REVENUE + COST AVOIDANCE) – EXPENSES]			
VARIANCE ($)	Year 1	Years 2-5	Total For Years 1-5
Grand Total	**196,238**	**105,552**	**301,790**

education and training efforts for existing pharmacy technician staff.

To offset program expenses, an estimate of revenue generated from tuition was conducted. A recruitment goal of 15 students in the first year and 26 students per subsequent year was used. In year 1, two 20-week sessions were facilitated. Thereafter, the program transitioned to 5 sessions per year with rolling admissions. A tuition fee of $3,350 was established to align with similar training programs surveyed. Overall, the estimated revenue from tuition over a 5-year period totaled $398,650 (Figure 1).

As mentioned previously, financial analysis must include a thorough review of the labor budget. Calculating the cost associated with a technician vacancy should include the institutional cost of a pharmacy technician vacancy as well as the cost associated with training a new technician. The estimated cost of a technician vacancy at YNHH was based on historical data suggesting a minimum of 12 weeks required to fill a vacant position. Based on our institution's practice of staffing unfilled shifts rather than eliminating them from the schedule (staffing down), the assumption was made that every hour of vacancy equaled 1 hour of overtime. Overtime was assumed because vacancies required existing full-time staff to fill the vacant shifts at an overtime rate. For a newly hired technician, 8 weeks was used to reflect the actual cost for staff to train a new technician. Based on an observed average historical vacancy rate of approximately 30 full-time equivalents (FTEs) per year, 10 FTEs was used to conservatively estimate the number of technicians we would be able to hire from the training program and thus avoid having to interview, onboard, and train. As a current full-time employee would be needed to train all new employees as well as cover any unstaffed shifts, a regular rate of $16.32/hour[5] and an overtime rate of 1.5 times the base rate, or $24.48/hour, were used. Based on the need for 12 weeks of overtime coverage per technician vacancy and 8 weeks of training time, there is an estimated cost avoidance of $19,584 per technician hired from the training program. Assuming 10 hires per year, the expected cost avoidance over 5 years totals $979,200 (Figure 1).

On the basis of our estimates of cost avoidance, revenue, and program expenses, the net revenue and cost savings of the program over the 5-year period was estimated to be about $301,790 if enrollment goals were met and technician vacancy rates remained similar to historical values (Figure 1).

Transforming a business plan into reality

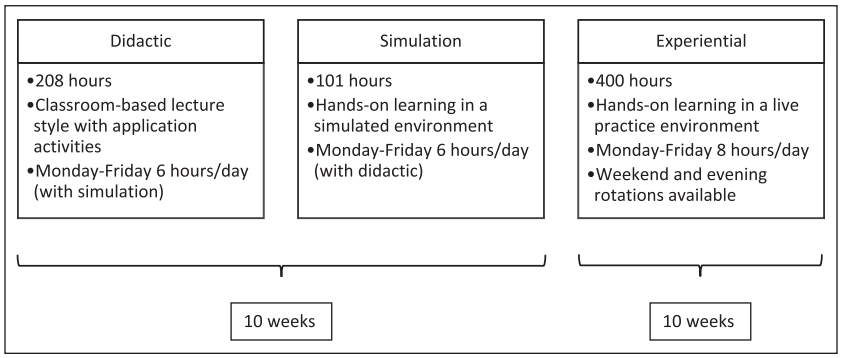
One of the most important aspects of a pharmacy technician training program is the curriculum. Whether the curriculum is developed in house or provided by a third-party vendor, program goals, objectives, learning experiences, instructional materials, and assessments must be identified. Ultimately, the curriculum signifies what the student should know and accomplish by completing the program and assists the preceptors in understanding how to achieve the goals set forth.

The 3 primary goals for our program graduates are to (1) pass the PTCE, (2) graduate in good standing from the ASHP-ACPE–accredited program, and (3) complete a successful transition from student to new hire as a certified pharmacy technician. With these goals in mind, the program curriculum was designed using the PTCE blueprint[12] and ASHP-ACPE recommendations for a model curriculum.[13] Additional consideration was given to hospital-specific training needs, to ensure that the program prepared students for a career in health-system pharmacy. These additional areas included automation and technology, professionalism, safety, and high-reliability principles. In this way, the authors sought to blend national standards with the unique needs of health-system pharmacy. An overview of the program curriculum and design is provided in Figure 2.

The program's marketing and recruitment strategy relied heavily on low-cost marketing activities that maximize exposure to target audiences, as well as strategic community partnerships. Attendance at community and school-based career events, adult education/GED programs, and area high school guidance departments is included in the coordinator's job responsibilities. Partnering with the hospital's marketing department is crucial to leverage the many resources and marketing channels already in place and avoid duplicative efforts. Social media is extremely valuable, providing a venue to share program information, open house events, and success stories. Finally, hospital computer screensavers are a useful tool to market the program to existing employees, patients, and visitors.

ASHP-ACPE accreditation standards emphasize the importance of hands-on experiential learning for program students.[14] Educational literature supports the value of hands-on learning in technical education.[15-17] As such, the authors sought to create a robust experiential learning component of the training program, allotting hours over the minimum required for this component. All experiential hours are completed at YNHH. This allows for quality control of the hands-on student experience and provides students with exposure to many potential areas for employment upon graduation. To maintain compliance with state law, a review of pharmacy technician scope of practice was performed. In Connecticut, pharmacy technicians are required to register with the state Department of Consumer Protection.[18] Connecticut law details that, for an individual to register as a pharmacy technician, they must present evidence of employment by a pharmacy. As program students are not employees, a waiver was sought so that program students would be able to act as pharmacy technicians without meeting state requirements for registration. The waiver allowed program students to participate in the hands-on learning of the experiential component, provided certain criteria were met regarding supervision and permissible activities (Box 1).

Figure 2. Curriculum design.



Program outcomes and quality assurance

Maintaining workforce development programs such as this during times of variability and uncertainty is a continuous journey. Competition from associate degree programs and existing state laws related to technician recognition can threaten our ability to cultivate growth and opportunity in this sector. Continuous monitoring of program success through the capture of quantitative student data is essential to identify gaps in the program and make tactical changes.

In the 4 years since the program's inception, 13 program sessions have been offered to 107 students. We endeavor to have a minimum of 12 students and a maximum of 15 students per session. A total of 95 students have enrolled in the program, representing an 89% enrollment rate upon acceptance. Students drop out or are dismissed from the program at a rate of 12%. Reasons for dropout or dismissal include competing work-related or personal priorities, inability to meet academic performance standards, or (in rare cases) behavioral concerns. Of the 73 students who remained in the program (eg, did not drop out or were not dismissed; demographics in Table 1), 79% (n = 58) went on to successfully pass the PTCE and graduate the program. Remediation opportunities are provided for didactic and

Box 1. Experiential Rotation Requirements For Program Students

Students must be paired 1:1 with a pharmacy technician who has completed departmental training and competencies and is registered with the state of Connecticut as a pharmacy technician.

All functions performed by a student must be overseen by a properly registered and trained pharmacy technician.

A student and a properly registered and trained pharmacy technician cannot simultaneously perform pharmacy technician functions.

All dispensing activities performed by a student or a properly registered pharmacy technician shall be subject to in-process and final checks by the supervising pharmacist.

The total number of students paired with properly registered pharmacy technicians shall not exceed the pharmacist to pharmacy technician ratio for the setting in which pharmacy technician functions are being performed.

Students shall not actively participate in the compounding of sterile and nonsterile product for patient use.

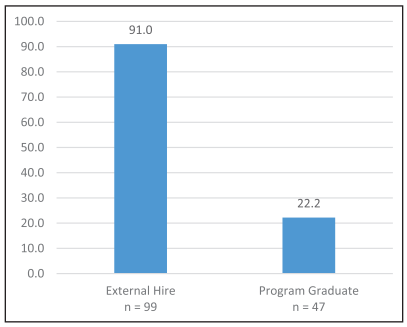
Table 1. Demographics and Background of Enrolled Students

Characteristic	No. (%)
Age	
16-25 years	37 (39)
26-40 years	40 (42)
41 years and over	18 (19)
Gender	
Male	31 (33)
Female	64 (67)
Current hospital or health-system employee	12 (13)
State Workforce Development Program referral	30 (32)
Prior pharmacy experience	3 (3)
Prior healthcare experience	16 (17)

simulation coursework for students with poor academic performance. Remediation and exam preparation sessions are offered to all students but are specifically required of those who do not pass the national certification exam on the first attempt. Students are permitted a maximum of 3 examination attempts. Academic performance and PTCE results are reviewed regularly by program staff as part of our ongoing quality assurance efforts.

Of students who graduate the program, 98% (n = 57) apply to open positions within the organization. Of those who apply, 84% (n = 48) receive an employment offer. To date, 47 program graduates have accepted an employment offer with YNHH. Graduates are hired in a number of diverse areas within the pharmacy department, including in central operations, the children's hospital, operating rooms, the cancer hospital, and the medication history team. This diversity in job placement reflects the wide variety of skills provided by the program and illustrates departmental management buy-in. As one might expect, program graduates are most frequently hired into positions in central pharmacy operations. Year after year, the percentage of total hires in central pharmacy that come from the program has grown. In year 1, 19% of open positions were filled with program graduates. In year 2, this number grew to 24%. In year 3, the percentage of open positions filled with program graduates was 36% (to date).

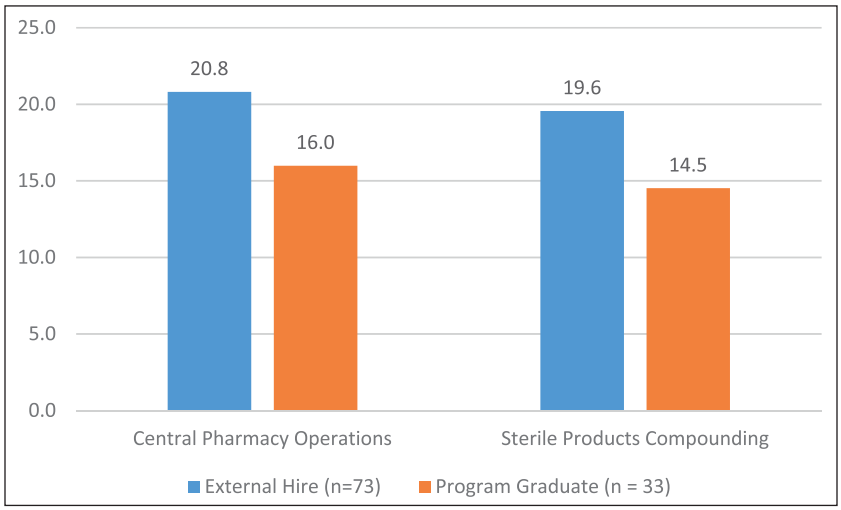
Figure 3. Average time to hire. Time to hire is shown in days.



Because program students begin the employment application process before graduation, the average time to hire is significantly lower than for external candidates. Historical data show that, on average, recruitment, interviewing, and human resources processing of external candidates require 91 days from start to first date of employment. Program graduates complete this process, on average, 22.2 days from graduation, representing a 76% reduction (Figure 3).

Of all program graduates hired since program inception, 87% are still employed with the organization to date (n = 41). Contributing factors may be the previously described hiring bonus for program graduates, paid out over a 2-year period, the lack of prior pharmacy experience required in other positions/roles, and a stronger sense of commitment to the organization and the profession as a result of investing in and completing the training program. Overall, 91% of program graduates find employment in a pharmacy setting

Figure 4. Average training time. Training time is shown in days.



upon graduation (n = 53), 92% find employment in a hospital or health-system pharmacy (n = 49), and 8% find employment in community pharmacy settings (n = 4).

Upon hire, program graduates also require less training time than traditional external hires. In the central pharmacy area, external hires typically train an average of 20.8 days (range, 13-42 days). Program graduates complete equivalent training an average of 4.8 days sooner, representing a 23% reduction in training hours for central pharmacy operations (Figure 4). External hires training in sterile product compounding typically train an average of 19.6 days (range, 11-28 days). Here program graduates complete training an average of 5.1 days sooner, representing a 35% reduction in training hours (Figure 4).

Conclusion

The unprecedented need for standardized education and training of pharmacy technicians in the acute care setting is due, in part, to the expanded role of pharmacists.[1,3,4] Creation of an ASHP-ACPE–accredited pharmacy technician training program is a means of generating a viable pool of qualified candidates for hire.

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Disclosures

The authors have declared no potential conflicts of interest.

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