Overview and Preparation Guide for Academic Careers in Pediatric Pharmacy, Part 1: Career as a Pediatric Pharmacy Practice Faculty Member

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Pediatric clinical pharmacy is a growing and evolving field with an increasing number of pediatric clinical pharmacists in academia. In 2017, pediatric practice faculty members represented approximately 7.6% of all pharmacy practice faculty in the United States. The benefits of practicing in an academic environment are many, including, but not limited to, the ability to shape the future of pharmacy practice through the training of the next generation of pharmacists, contributing to science through research and scholarly activities for the care of pediatric patients, and positively impacting patient care for the most vulnerable of patients. Part one of this two-part series describes careers in academic pediatric pharmacy, as well as faculty roles and responsibilities, and provides information and advice related to the preparation and transition into careers in academic pediatric pharmacy.

ABBREVIATIONS AACP, American Association of Colleges of Pharmacy; ASHP, American Society of Health-System Pharmacists; APPE, advanced pharmacy practice experience; DOE, distribution of effort; PGY, postgraduate year; TLC, Teaching and Learning Certificate

KEYWORDS academic responsibilities; clinical responsibilities; clinical track pharmacy faculty; pediatric pharmacy

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Introduction

The role of a clinical pharmacy faculty member in US colleges of pharmacy has evolved over the years.¹ Pediatric pharmacy practice represents one important area of expansion. According to the American Association of Colleges of Pharmacy (AACP), the number of Pediatric Pharmacy Special Interest Group faculty members has increased from 89 in 2013 to 136 in 2018.² Pediatric pharmacy practice faculty members represent approximately 6.2% (136 of 2183) of all current pharmacy practice faculty (AACP Pediatric Pharmacy Special Interest Group, email communication, February 12, 2019). There is variability across academic institutions with respect to faculty models as well as the focus and incorporation of pediatrics into colleges of pharmacy. Although most colleges incorporate pediatric-related education to some extent, there is wide variation in the scope and depth to which pediatrics is covered in the core curriculum nationwide.

Pediatric practice faculty members are expected to engage in the primary pillars of clinical pharmacy academia: teaching, research and scholarship, and service, including clinical service/practice. Although the weighting of these facets varies between institutions, these foci create the foundation for day-to-day respon-

sibilities of clinical faculty members. Demonstrated success and excellence in each area are important for ongoing growth and professional development, annual feedback and evaluation, and academic career advancement/promotion.

At most institutions, the number of pediatric faculty members is limited. This can create unique challenges for pediatric faculty members, such as increased teaching duties, reduced opportunities for mentorship and collaboration on projects, and lack of familiarity from faculty peers with respect to the expectations and responsibilities of pediatric clinical pharmacists and faculty members.

To date, little has been published regarding careers in academia for pediatric pharmacy practitioners. This two-part series addresses this gap. Part 1 describes careers in pediatric pharmacy academia, delineates faculty roles and responsibilities, and provides information and advice related to the preparation for a transition into careers in academic pediatric pharmacy, including select challenges. This review is intended for students, postgraduate trainees, and practicing pediatric pharmacists interested in or reflecting upon careers in academia. Part 2 will focus on academic advancement/promotion as well as unique challenges and aspects specific to pediatric clinical faculty members.

Table 1. Select Benefits of Careers in Pediatric Clinical Pharmacy Academia		
Training the Next Generation of Pharmacists	Contribution to Science Through Research and Scholarship	Positively Impact Patient Care
<ul style="list-style-type: none">• Opportunity to “pay it forward”• Model the way for students and trainees• Share/teach clinical knowledge, skill sets, and experiences• Act as an advisor/mentor to students and trainees• Ability to shape curricular changes	<ul style="list-style-type: none">• Engage in meaningful research to progress field of pediatric pharmacy• Disseminate research findings and expertise to affect populations on a global level	<ul style="list-style-type: none">• Collaborate with health care professionals to maximize the pharmacist patient care process for pediatrics• Work with vulnerable pediatric patients to improve health care outcomes• Create policies and guidelines to ensure medication safety in pediatrics• Participate in pediatric community outreach programs

Preface: The Benefits of Academia

Careers in pediatric clinical pharmacy academia are rewarding on a number of levels. Although the reasons why one chooses to pursue a career in academia and the subsequent benefits each faculty member finds in academia are personal, there are several global benefits that may be attractive. At the highest level, these include but are not limited to the ability to shape the future of pharmacy practice through the training of the next generation of pharmacists, to contribute to research and the literature, and to positively impact patient care for the most vulnerable of patients. The authors of this review collectively summarized a few of the many benefits each find within academia (Table 1).

An additional benefit is the frequently changing dynamic and daily routine of a pharmacy practice faculty member. Intellectual benefits include participating in faculty professional and development programs to improve teaching and learning or leadership skills. Numerous opportunities to become engaged on the professional level exist, including leading or serving on committees, serving the community, participating in professional development activities, and collaborating with other health care professionals on the local, national, and international levels.

Pharmacy Practice Faculty: Ranks, Roles, and Responsibilities

The department of pharmacy practice is often the largest department in a college of pharmacy. The faculty typically comprise individuals with diverse clinical interests, with most practicing in adult populations. This section provides a perspective of academic appointments available for pediatric pharmacists within colleges of pharmacy. Designations and titles may differ among colleges of pharmacy. The availabilities of tracks, expectations, and tenure timelines differ by institution. Table 2 summarizes these faculty titles.

Faculty Rank. All pharmacy practice faculty members, regardless of rank, are expected to contribute to

the core missions of academia. The specific goals and missions differ between institutions, although commonalities across clinical pharmacy academia include education of students, professional service, service to the college and university, research and scholarly activities, and clinical practice/patient care–related duties. Some institutions have additional faculty tracks outside the traditional clinical track, such as a clinical teaching track and adjunct faculty track. In the clinical teaching track, faculty members may contribute to education, service, and clinical practice/patient care–related duties, with limited expectations for scholarship and research activities. Adjunct faculty members, instructors, or lecturers are appointed on a part-time basis to fulfill specific needs and are usually practicing pharmacists whose main roles include clinical practice/patient care as well as the experiential education of students. In addition to title recognition from the college of pharmacy, at some institutions these individuals may receive monetary reimbursement for the contributions, or services may be rendered on a volunteer basis.

For the purposes of this review, the remainder of this section will focus on faculty members in a traditional faculty track in the early stages of an academic career (e.g., assistant professor rank). The title of faculty members at the same rank depends on tenure or non–tenure track. For example, at some institutions a new tenure-track faculty member is designated as an assistant professor, whereas a non–tenure-track faculty is known as a “clinical” assistant professor. Regardless of tenure or non–tenure-track designation, faculty members work toward promotion and advancement through the academic ranks, with each rank associated with specific expectations, criteria, and recognition. There are 3 main traditional faculty ranks: assistant professor, associate professor, and full professor. Many institutions also have an instructor or lecturer rank. Each rank is briefly summarized below. Although the purpose of this review is to focus on early academic careers, it is important for junior faculty members to consider and be aware of the expectations associated with advancing through

Table 2. Characteristics of Pharmacy Practice Faculty

Faculty Rank	Description
Assistant professor*,†	<ul style="list-style-type: none"> ▪ Junior faculty ▪ Considered a member of the “traditional faculty ranks” ▪ Devote full-time effort to the mission of the school of pharmacy (e.g., education of students, research and scholarly activities, and clinical practice/patient care–related duties, professional service) ▪ Depending on the terms of appointment, faculty can undergo multiple reappointment periods (e.g., yearly) ▪ Unless in a tenure-track position, faculty can be given a 1-year notice of non-reappointment ▪ Faculty members typically hold this rank for at least 5 to 7 years before promotion to associate professor
Associate professor*,‡	<ul style="list-style-type: none"> ▪ Same description as assistant professor unless noted ▪ Midlevel faculty ▪ Continued devotion in the mission of the school of pharmacy, such as education of students, professional service, research and scholarly activities, and clinical practice/patient care–related duties. Excellence in at least one of these areas ▪ Recognition at local, regional, or state level ▪ May stay at this rank indefinitely, but may choose to apply for promotion to full professor after a minimum of 5 to 10 years at this rank
Professor*,‡	<ul style="list-style-type: none"> ▪ Same description as assistant professor unless noted ▪ Senior faculty ▪ Continued excellence in the mission of the school of pharmacy, such as education of students, professional service (i.e., chair committees within the college or at the university level), research and scholarly activities, and clinical practice/patient–care related duties. ▪ Recognition at the national or international level
Temporary faculty*,‡	<ul style="list-style-type: none"> • Faculty non-tenure track with rank titles (e.g., clinical assistant, clinical associate, research assistant, research associate) that devote less of their full-time professional effort to the school of pharmacy’s mission • Appointments can be terminated during the academic year • Not permitted to serve some roles within the university (e.g., Faculty Appeals Board or Faculty Senate) • Promotion and advancement qualifications vary among institutions
Instructor or lecturer*,‡,§	<ul style="list-style-type: none"> • Faculty with academic achievement and standing comparable to other faculty • Appointments can be terminated during the academic year • Not permitted to serve some roles within the university (e.g., Faculty Appeals Board or Faculty Senate)
Volunteer faculty*,‡	<ul style="list-style-type: none"> • Faculty with academic achievement and standing comparable to other faculty • Serve without remuneration

* Full-time faculty.

† Tenure or non-tenure.

‡ Part-time faculty.

§ Adjunct faculty.

the academic ranks (e.g., associate and full professor ranks), which will be further discussed in part 2 of the series. This series provides an overview of information regarding academic pediatric pharmacy, but current faculty members and position-seekers should refer to institution-specific policies and criteria.

Instructor or Lecturer. Instructors or lecturers are typically hired to contribute to the academic mission of teaching, often based on a specific need. Teaching may be in the didactic or experiential setting, and it often involves patient care laboratory or simulation activities. These faculty members have a terminal degree, such as a Doctor of Philosophy, and may have advanced postgraduate training. Some colleges of pharmacy provide postgraduate trainees, pharmacy residents,

or fellows with academic titles as a clinical instructor. In addition, instructors or lecturers are typically not eligible for promotion.

Assistant Professor. At the assistant professor rank (e.g., junior faculty), faculty members must hold a terminal degree and, in most cases, have completed advanced postgraduate training, such as pharmacy residency and/or fellowship training. Board certification or advanced credentialing may also be required, especially in today’s environment with the availability of pediatric board certification. To be appointed at the assistant professor level, the faculty member must demonstrate capabilities of independently teaching both in the didactic and experiential settings, perform research and scholarly work, and achieve success in

service, including in the clinical setting.³ Collaboration with peer colleagues is also expected in all of these areas. Steps towards recognition at the national and international levels are also expected. Under normal circumstances, faculty members remain at the assistant professor rank for at least 5 to 7 years before being considered eligible for promotion to the associate level.

Shared or cofunded faculty positions, also known as “50/50,” have become popular and are attractive to faculty members who wish to continue clinical practice and enter academia.⁴ Shared or cofunded faculty positions are contracts among institutions and may be composed of partial funding from the practice site and the college of pharmacy. Administration at the college of pharmacy and clinical practice site must have mutual understanding and agreement on the faculty member’s responsibilities and expectations. Some colleges of pharmacy also have opportunities for faculty members interested in job sharing. Job sharing is defined as when 2 professionals partner together to perform 1 job and may provide flexibility on work/life balance.^{5,6} Further, at some institutions, pharmacy faculty may have cofunded positions with other health care profession schools, such as colleges of medicine or nursing.

Associate and Full Professor. Both associate (e.g., midlevel rank) and full professor (e.g., senior faculty) ranks require successful promotion from assistant and associate, respectively, and predetermined criteria for promotion and excellence in all areas of teaching, scholarly activities, and service. Table 2 provides a description of the associate and full professor ranks. Part 2 of the series will further elaborate on the characteristics of these ranks.

Tenure Track Versus Non-Tenure Track. Faculty members may be designated as either tenure track or non-tenure track. As defined by the American Association of University Professors, “a tenured appointment is an indefinite appointment that can be terminated only for cause or under extraordinary circumstances such as financial exigency and program discontinuation.”⁷ Tenure and promotion are completely separate processes, although they are often mentioned together. In general, faculty members in the tenure-eligible track are evaluated for tenure at the time of evaluation for promotion from the rank of assistant to associate professor. If successfully promoted with tenure, the awarding of tenure results in guarantee of academic freedom and increased job security. However, if promotion with tenure is unfavorable, the faculty member’s appointment for the following year will become a terminal one and the faculty member must leave the institution after the expiration of the 1-year probationary period.⁸ Once tenure is granted, these faculty members are expected to have a higher output of research and scholarship and are usually required to obtain more extramural funding compared with non-tenure-track peers. In order to do so, the distribution of effort (DOE; refer to the section

below) may be more heavily weighted toward research and scholarship compared with teaching and clinical service. Pediatric clinical faculty members in a tenure-track appointment who also have active practice sites require assistance from college or university administration in order to set clear boundaries with the practice site to promote success in tenure evaluation.

Roles and Responsibilities. Similar to other pharmacy practice faculty members, pediatric faculty members are expected to engage in teaching, participate in research scholarship, provide service activities, and develop and maintain a clinical practice.⁹ In this section, an overview of DOE will be provided, followed by a summary of the functions of a pediatric pharmacy practice faculty member: teaching, scholarly activities, clinical practice, and service responsibilities.

Distribution of Effort. The definition of DOE is defined by colleges of pharmacy and also differs among faculty titles. However, DOE is typically referred to as the amount of effort a faculty member is expected to devote to the individual facets of academia. Limited research has been published in this area for pharmacy practice, with clear metrics and benchmarks to measure productivity.^{10,11} Clinical pharmacy practice faculty effort is often measured for the academic year and is divided among 4 categories: teaching, scholarly activities, clinical practice, and service responsibilities. The percentage and distribution for each category are set by and authorized among individual colleges or departments and are commonly outlined in offer letters and/or yearly evaluations. The breakdown of DOE for tenure track versus non-tenure track also differs. A hypothetical DOE for a non-tenure-track DOE may include 65% teaching/practice, 20% research/scholarship, and 15% service, whereas a tenure-track DOE may include 20% teaching/practice, 65% research/scholarship, and 15% service.¹²

Teaching. Teaching is a core component of any faculty position. Teaching responsibilities include didactic (e.g., classroom teaching), experiential, and other teaching/coaching through precepting of research and scholarship activities. In the classroom setting, the pediatric faculty member is likely to be responsible for teaching pediatric-related content within the curriculum. At most institutions, all students receive a basic level of education related to general pediatric concepts, such as communication with pediatric patients, pharmacokinetic/pharmacodynamics differences in pediatrics, as well as pediatric medication-related concepts (e.g., dosing, palatability, drug information resources, etc.).¹³ Specific disease states may also be covered within the required curriculum, such as otitis media, sickle cell disease, and attention deficit hyperactivity disorder. Many institutions integrate pediatric-related concepts throughout the required curriculum, rather than having distinct modules in the pharmacotherapy sequence devoted to pediatrics. Alternatively, some institutions dedicate a specific module solely to general pediatric

concepts. Outside of the required curriculum, pediatric faculty members may be involved in one or more elective courses devoted to more advanced pediatric disease state-specific topics. To be a good citizen of the institution, pediatric faculty members are expected to contribute when needed and may also be called upon to teach non-pediatric-related material in the required professional curriculum.

Pediatric faculty members are additionally expected to precept students and postgraduate trainees in the experiential setting. This may include introductory pharmacy practice experiences, advanced pharmacy practice experiences (APPEs), and rotations for residents and fellows. These experiential rotations may be at the clinical practice site, within academia, or in a hybrid of both settings. Each institution has a minimum requirement of learners per year, but it is a basic expectation that faculty members will contribute to experiential education.

Research and Scholarly Activities. Academic pharmacy organizations have identified research and scholarship as an important aspect for all pharmacy practice faculty members. Because of these requirements, colleges and universities have incorporated an expectation for high-level research and scholarly activities to be conducted by faculty members.^{14,15} Boyer¹⁶ divides scholarship into 4 categories, namely the scholarship of: (1) discovery, considered traditional research; (2) integration, which is connecting information across disciplines; (3) application, which is integrating basic science with clinical practice; and (4) teaching, which is showing how different modes of teaching can affect student learning.

Competence in research/scholarly activities includes a variety of types of output including, but not limited to, submitting for externally funded research or training grants, completion of research and quality improvement projects, and presentation of posters and abstracts. Federal grants, such as the National Institutes of Health Research Project Grant (R01), are highly recommended and may be required by tenure-track faculty members to obtain, which will be discussed further in part 2 of the series. Faculty members are also required to contribute to the literature through dissemination of knowledge via presentations and publications. Each institution has expectations for the types of publications/contributions and the value of each. For example, faculty members may be required to be the primary or corresponding author on peer-reviewed submissions. For consideration for academic advancement/promotion, the body of work must have been completed during the time at the institution at that appointment level (e.g., rather than as a student or trainee). Depending on whether or not an institution is considered research intensive, expectations and requirements may be more stringent. At the assistant professor rank, most colleges expect 2 to 6 peer-reviewed publications (or contributions) per year. Examples of peer-reviewed publications include

original research articles, case reports, review articles, or book chapters. Coleman and colleagues indicated that faculty members at academic research-intensive settings averaged 13.1 original research articles during 5 years compared with 3.3 during 5 years for those at non-research-intensive institutions.¹⁷ Tenure-track faculty members are highly encouraged and may be required to complete original research articles.

Several challenges and barriers that affect the ability for practice faculty members to succeed in scholarship and research have been identified. A web-based survey conducted in 2005 with 82 clinical track faculty member respondents noted a lack of confidence in research skills, the need for reward for efforts, and difficulty balancing academic responsibilities as key challenges.¹⁸ Teaching was identified as an influencing factor to scholarly output; specifically, faculty with heavy teaching loads reported fewer publications compared with those with lighter teaching loads across all academic ranks.¹⁵ Therefore, time management, organization skills, and balancing responsibilities in teaching, scholarly activities, clinical practice, and service are important characteristics for faculty members.

An additional point worth noting in the research and scholarship realm is the importance of faculty members contributing to the literature through the peer review process and/or serving as an editorial board member for a journal within the practice specialty area. Serving in these capacities early in the professional career has personal benefits in terms of growth and development and is also critical for maintaining the integrity of the scientific process and quality of pediatric literature.

Clinical Pharmacy Practice. Most new pharmacy practice faculty members are recent graduates from advanced postgraduate residency or fellowship programs and therefore have the clinical knowledge and skills to develop a practice site.¹⁹ It is estimated that pharmacy practice faculty members devote approximately 25% to 75% of effort to clinical practice related to patient care activities.²⁰ Pediatric clinical faculty members provide either direct or indirect patient-centered care activities in specialized areas of pediatric practice. Direct patient-centered care is defined as providing primary care to the patient that may involve pharmacotherapy management, medication reconciliation, or patient counseling. Indirect patient-centered care is described as drug information or practice management (e.g., guideline development).¹¹ The pediatric faculty member is expected to become an integral member of the medical team, act as the clinical pharmacist for the team, and develop, implement, and maintain practice guidelines. Additionally, pediatric faculty members are expected to teach learners, both students and postgraduate trainees, on experiential rotations in order to facilitate the acquisition of general knowledge and skills in pediatric pharmacotherapy, and to demonstrate the 4 preceptor roles in pediatric pharmacy practice (e.g., instructing,

modeling, coaching, and facilitating).²¹

Service. Opportunities for pediatric pharmacy practice faculty members in the area of service are unlimited. Service involves service to the institution, the profession, and at the local, regional, national, and international levels. At the institutional level service may include committee involvement, faculty advising to student organizations, involvement in mentorship programs, and participating in continuing education programs. New pharmacy practice faculty members are either assigned or provided an option to select a committee of interest. Examples of committees at the college level include Faculty Development, Scholastic Standing, Admissions and Recruitment, Curriculum, and Honors. Faculty members may also provide service activities related to patient-centered care while working in collaboration with the multidisciplinary team by serving on committees such as the Pediatric Pharmacy and Therapeutics, Medication Safety, or Antimicrobial Stewardship committees, to name a few. Faculty may also be involved in multidisciplinary educational efforts, such as teaching or facilitating coursework in other health care professional programs, participating in nursing in-services, medical resident and/or fellow teaching, and as physician assistants.

Pediatric faculty members also have endless opportunities to become involved in local, national, and international pharmacy and other health care organizations. Membership in local and state pharmacy organizations is essential for networking, collaborating, and promoting pediatric pharmacy services. As an active member of a national organizations, a faculty member can further join a special interest group within an area of expertise (e.g., neonatology, critical care, infectious diseases, general pediatrics). Several professional organizations, such as the AACP, target advancing pharmacy education, scholarship, practice, and service, specifically promoting pediatric faculty members from other colleges of pharmacy to collaborate and communicate with each other. This type of collaboration is essential across institutions, because peer-to-peer collaboration may be limited at each individual institution because of the limited number of pediatric-focused faculty members at each college. Over time, the attainment of Fellow status in professional organizations is viewed by colleges of pharmacy as a national recognition and helps support promotion to the next professor rank. At the international level, faculty members may seek involvement in organizations like the International Pharmaceutical Federation as well as in multidisciplinary organizations that have international representation, such as Pediatric Academic Societies or other organizations more specific to specialty practice area.

Tips for Success

Piece of Advice No. 1: Preparation for Academic Pediatric Pharmacy. Initial exposure to pediatrics and

academia can occur in the Doctor of Pharmacy curriculum, when students are exposed in the didactic and/or experiential settings. In 2014, Prescott and colleagues²² conducted a survey of 86 Doctor of Pharmacy programs, noting that 81 programs (94.2%) had pediatric content in the required curriculum, with a mean of 21.9 ± 22.9 contact hours. In addition, 52 programs (61%) had a pediatric elective. The authors also found that 97.4% of responding programs offered APPE rotations specializing in pediatrics, with a mean of 27 students taking a pediatric APPE rotation per program. These experiences provide an excellent entry point for student pharmacists interested in learning about pediatric pharmacotherapy and career opportunities. Some programs also offer pediatric curricular tracks that enable students to gain additional exposure to skills and content in pediatric pharmacy, which may not be covered in required or elective courses. Data from one such program found that 40% of graduates from this curricular track went on to complete postgraduate training residency programs that specialized in pediatrics or offered several pediatric rotations.²³ Initial exposure to careers in academia for students typically comes from formal and informal interactions with faculty members; involvement in student organizations, such as the Pediatric Pharmacy Association, the AACP, and the American College of Clinical Pharmacy; attendance at national professional meetings; and involvement with research and scholarship. Additionally, some students may elect to take an APPE rotation focused in academia.

For students interested in pursuing a career in academia with a focus in pediatrics, advanced postgraduate training is necessary. There are several pathways one can pursue to obtain specialized pediatric training; however, a clear, one-size-fits-all pathway to academia does not exist. Select pathways may include: a general postgraduate year 1 (PGY1) pharmacy residency at an academic medical center followed by a PGY2 pediatric pharmacy residency; a pediatric-focused PGY1 pharmacy residency followed by a PGY2 pediatric pharmacy residency; a general PGY1 pharmacy residency followed by pediatric-focused fellowship training; or a general PGY1 pharmacy residency plus a PGY2 pediatric pharmacy residency followed by pediatric-focused fellowship training. Completing a PGY2 pediatric pharmacy residency and/or pediatric-focused fellowship training with a heavy emphasis in research is highly recommended for individuals pursuing a career as a tenure-track faculty member. The American College of Clinical Pharmacy provides guidelines for research fellowship training programs requiring 3000 hours of fellowship training time devoted to research during 2 years.²⁴

Currently, there are 52 PGY1 pharmacy residencies in children's hospitals and 51 PGY2 pediatric pharmacy residencies across the United States.²⁵ Some children's hospitals with pharmacy residency programs are located in an academic medical center with affiliations

Table 3. Teaching, Education, and Dissemination from the ASHP Pediatric Pharmacy Residency Competency Document^{25,26}

Goal R4.1: Provide effective medication and practice-related education to pediatric patients, caregivers, health care professionals, students, and the public (individuals and groups)

Obj R4.1.1	Establish oneself as an organizational expert for pediatric pharmacy-related information and resources
Obj R4.1.2	Ensure appropriate pediatric pharmacy resources as available
Obj R4.1.3	Design effective educational activities related to the care of pediatric patients
Obj R4.1.4	Use effective presentation and teaching skills to deliver education related to pediatric pharmacy
Obj R4.1.5	Use effective written communication to disseminate knowledge related to pediatric pharmacy
Obj R4.1.6	Appropriately assess effectiveness of education related to pediatric pharmacy
Obj R4.1.7	Provides effective patient and caregiver education

Goal R4.2: Effectively employ appropriate preceptor roles when engaged in teaching students, pharmacy technicians, or fellow health care professionals about the care of pediatric patients

Obj E4.2.1	When engaged in teaching about the care of pediatric patients, select a preceptor role that meets learners' educational needs
Obj E4.2.2	Effectively employ preceptor roles, as appropriate, when instructing, modeling, coaching, or facilitating skills related to care of pediatric patients

to a college of pharmacy, and others are located in an academic medical center within a college of medicine, and still others are located in a nonacademic setting. The setting may impact a resident's opportunities to participate in teaching activities in both the didactic, laboratory, and experiential settings. Those interested in pursuing a career in academia should give strong consideration to training at an academic medical center or at a program affiliated with a college of pharmacy because these offer ample opportunity to develop teaching skills and learn from other full-time faculty members. Further, programs with a heavy emphasis on research and scholarship may better prepare a resident to seamlessly enter a career in academia, where faculty members must balance practice, teaching, and research/scholarship.

Teaching Preparation. The American Society of Health-System Pharmacists (ASHP) has developed competencies, including goals and objectives for PGY1 pharmacy and PGY2 pediatric pharmacy, related to teaching, education, and dissemination of knowledge.^{26,27} Table 3 provides an overview of the goals and objectives from this competency area from the ASHP PGY2 pediatric pharmacy competency document. It should be noted that these competency areas are limited in scope because they apply to delivery of in-services and presentations within the hospital rather than the in-depth, rigorous instructional materials that would be delivered within a Doctor of Pharmacy program. Both the ASHP PGY1 pharmacy and PGY2 pediatric pharmacy residency competency documents include elective goals and objectives focused on academia. Table 4 provides an overview of the elective competencies for the ASHP PGY2 pediatric pharmacy competencies.^{26,27} These competencies stress the need for learning opportunities, such as the development of a teaching philosophy and portfolio, and the opportunity

for additional teaching activities, including case-based discussions and laboratory experiences.

To accomplish these more advanced competency areas in teaching, a number of residency programs across the United States have offered residents the opportunity to participate in teaching and learning certificate (TLC) programs. The first documentation of a TLC program was described in 1998.²⁸ These programs require residents to participate in structured programming activities on teaching methodologies, assessment strategies, and activities. Residents are required to participate in both didactic and experiential teaching, with formalized evaluation and feedback. Strang et al²⁹ conducted a systematic review of teaching and learning programs in pharmacy education between 2001 and 2017. They found 19 publications, representing 21 teaching and learning programs; most of the programs last for the span of 1 year. Although most TLC programs target PGY1 pharmacy residents, Medina and Herring³⁰ developed a unique model specifically designed for PGY1 (Foundational Teaching Skills for Residents) and PGY2 (Advanced Teaching Skills for Residents) residents. There remains considerable variability in the content, requirements, and settings of these programs. Most programs are offered at institutions that are affiliated with a college of pharmacy. However, ASHP in partnership with the University of Kentucky College of Pharmacy offers an asynchronous program that residents and practitioners can complete online.³¹ As a result of the lack of standardization, Wright et al³² have developed best practices of TLC programs to ensure that participants receive the best experiences.

Although TLC programs provide excellent training for residents interested in transitioning into a faculty role, learning the art of teaching is a process that evolves throughout a career in academia. In recent years, pedagogic methods have changed from a didactic lecture

Table 4. Elective Academic Goals for Postgraduate Year 2 Pediatric Pharmacy Residents^{27,28}**Goal E1.1:** Demonstrate understanding of key elements of the academic environment and faculty roles within it.

Obj E1.1.1 Demonstrates understanding of key elements of the academic environment and faculty roles within it

Goal E1.2: Exercise case-based and other teaching skills essential to pharmacy faculty

Obj E1.2.1 Develop and deliver cases for workshops and exercises for laboratory experiences

Obj E1.2.2 Compare and contrast methods to prevent and respond to academic and profession dishonesty and adhere to copyright laws

Goal E1.3: Develops and practices a philosophy of teaching

Obj E1.3.1 Develop or update a teaching philosophy statement

Obj E1.3.2 Prepare a practice-based teaching activity

Obj E1.3.3 Deliver a practice-based educational activity, including didactic or experiential teaching, or facilitation

Obj E1.3.4 Effectively document one's teaching philosophy, skills, and experiences in a teaching portfolio

format to a hybrid of lectures and flipped classrooms. Assessment has moved from traditional examination of cognitive understanding to a combination of test-based and applied skills-based assessment. For those interested in academia, initial and varied exposure during postgraduate training is an excellent first step in this process. To better prepare them for entrance into academia, it is beneficial for the postgraduate trainee to seek supplemental professional development and more experience in teaching (e.g., Teacher's Seminar and other programming at the AACP Annual Meeting).

Research and Scholarship. Research and scholarship are an essential part of the student's and postgraduate trainee's education. For some, this is critical to building an interest in conduction research and publishing finding. For all, this enables the development of knowledge in the identification and refinement of a hypothesis, grant development and writing, statistical analysis, and Institutional Review Board approval. An emphasis on scholarship enables the trainee to understand the importance of sharing information and enables him or her to gain an understating of the publication process. Hopefully, this culminates in an opportunity for the trainee to develop an abstract and share his or her findings as a poster or platform presentation at a professional meeting. All of these experiences are critical to a more fluid transition into a faculty role at the end of training and to ultimate success as a member of the academy.

Exposure to clinical research may be limited for many doctor of pharmacy students, but some may have opportunities to complete a longitudinal project with a faculty mentor. For postgraduate trainees, a longitudinal project is a standard requirement of ASHP-accredited PGY1 and PGY2 residency programs.^{26,27} These projects provide the trainee with exposure to the design and execution of research from beginning to end. However, the ASHP standards allow for these projects to focus on either a quality improvement initiative or clinical research project. As a result, postgraduate trainees' exposure to clinical research depends on the environment and the type of project. Trainees who complete postgraduate training in nonacademic environments

may not have the research mentorship or biostatistical support needed to complete a successful traditional research project. For those interested in academia, seeking a program developing research skills and learning from preceptors conducting and publishing research are essential.³³

Although ASHP requires PGY1 and PGY2 residents to present research findings at a local, regional, or national conference, publication is not a requirement (ASHP PGY1 pharmacy and PGY2 pediatric). Rather, postgraduate trainees must submit their final project in a format suitable for publication. Studies have attempted to determine publication rates of the longitudinal projects of pharmacy residents and found that between 4.3% and 15.8% of residents successfully published findings in a peer-reviewed journal within 2 years of program completion.^{34–36}

Stranges et al³⁷ noted that residents whose project incorporated a cross-sectional study design and was completed at an academic medical center were more likely to have a higher publication success rate. In addition to this, O'Dell and Shah³⁶ noted that PGY2 residents had a higher publication success rate than PGY1 residents. As discussed above, publication is an important requirement for practice faculty; therefore, postgraduate trainees are essential to gain early exposure to the publication process in order to help with success once in an academic role.

In addition to a longitudinal research project, postgraduate trainees interested in academia are urged to seek out additional opportunities for scholarship, such as completion of additional writing projects, including case reports, letters to the editor, and/or review articles. The ability to complete this type of scholarship under the advisement and mentorship of several preceptors is a helpful step to enhance their academic career and make them more competitive in the job market.

Piece of Advice No. 2: Importance of Mentorship. Mentorship plays an integral role in the development of students, postgraduate trainees, and pharmacists interested in transitioning into academia. Mentorship plays a critical role in obtaining a pediatric faculty po-

sition and is equally important to the development of pharmacy practice faculty.³⁸ The Institute of Medicine defines a mentor as a faculty advisor, career advisor, skills consultant, and role model for the mentee.³⁹ However, a faculty member may have various role models throughout his or her academic career that may not necessarily be as a mentor.

It is important for students and postgraduate trainees interested in pursuing careers in academia to have exposure to the pillars of academia (teaching, scholarship activities, clinical practice, and service responsibilities).²⁰ Completion of academic experiential rotations or through longitudinal mentoring from pediatrics-trained faculty members will allow the trainee to understand the balance of these activities.⁴⁰ A survey completed by the participants in the AACP Walmart Scholars program indicated that mentors inspired students, influenced the decision to become involved in academia, and helped improve the utility of the program.⁴¹ The activities in the scholarship program align with academic pharmacy. As learners observe, interact with, and receive guidance from mentors, an informed decision regarding the choice to pursue a career in academia can be made.

Once in an academic role, new pediatric pharmacy practice faculty need professional development to ensure successful transition and advancement.⁴² Research suggests that mentoring programs, including pairing new faculty with senior faculty members, are effective in improving career development and productivity, increasing job satisfaction, enhancing quality of life, increasing the likelihood of promotion, stimulating salary growth, and retaining faculty members.^{43–46} Mentorship in the area of scholarly productivity receives the most attention, but other topics that may be discussed or evaluated between the mentor and mentee include didactic classroom management, assessment of teaching effectiveness, examination question development and other student assessment strategies, creation and maintenance of clinical practice site, institution/regional/national service involvement, promotion and tenure development, and balancing academic obligations.⁴⁷

Most pharmacy academic institutions have developed formal or informal mentoring programs. In formal mentoring programs, junior faculty members are paired with senior faculty members and are guided by a framework to help acclimate the new faculty into the institution. Mentorship can also be provided by individuals from another institution, experienced local pediatric pharmacists, pediatric faculty from other health care colleges, or non-pediatric faculty within the college. Distance mentors are usually available for informal mentoring. In informal mentoring programs, 2 individuals organically develop a mutual and professional relationship over time.⁴⁸ Because informal mentoring requires the pediatric faculty member to seek out the mentor and requires a period of time to build the relationship, informal mentoring may be more

common after the initial career transition and as the academic career evolves.

Piece of Advice No. 3: Professional Service and Board Certification. Those interested in pursuing a career in academia are encouraged to seek training at an institution that will allow for the development of service skills at the local and national levels. The residency program should promote involvement in professional service (e.g., organizational committee work, attendance at conferences). Involvement at the national and/or international level in the area of specialty as well as with a strong pharmacy or academic pharmacy organization is recommended. Students who are interested in pediatric academia are encouraged to seek involvement early on student organizations or leadership positions.

Board certification is encouraged for pediatric faculty nationwide. In 2015, the Board of Pharmacy Specialties recognized Pediatric Pharmacy as a specialty. In order to be eligible to sit for the Board Certified Pediatric Pharmacotherapy Specialist exam, graduation from an ACPE-accredited program and the maintenance of active pharmacy licensure plus one of the following is required: (1) completion of 4 years of practice (after licensure) in the pediatric setting (minimum of 50% of time spent in pediatric pharmacy activities), (2) completion of a PGY1 residency plus 2 years of practice in the pediatric setting (minimum of 50% of time spent in pediatric pharmacy activities), or (3) completion of a specialty PGY2 residency in pediatric pharmacy.⁴⁹ Although not a requirement for employment as a pediatric faculty member, board certification would be viewed favorably. Board certification is an asset in promotion from the assistant to associate professor rank; as such, those interested in pursuing a career in academia should plan on seeking board certification when eligible to sit for the examination.

Piece of Advice No. 4: Additional Tips for Success. Additional tips for success as a new pediatric faculty member are largely anecdotal, given the paucity of evidence-based literature in this area. Wanat and Garey⁴⁰ used available literature to develop a starting blueprint to transition postgraduate trainees into being successful clinical faculty members. This advice is certainly applicable to pediatric faculty members. An understanding of DOE and other expectations from both the academic institution and the practice site is critical. If these expectations are at odds, clarification should be sought with the support of the primary institution of employment, such as the college of pharmacy, especially with regard to time spent at the clinical site, on-call requirements, experiential student assignments, and process for changes. The faculty member should actively and routinely seek honest, constructive feedback regarding performance and contributions in both the academic and practice settings. It is best to remain open to continuous improvement and to seek

development opportunities in teaching, service, and scholarship in consultation with one's department chair. Faculty members should be encouraged to learn how and when to say yes and no. This is of particular importance to lone pediatric faculty members who struggle with the demand to take on each and every pediatric need at the institution.

Conclusions

A career as a pediatric pharmacy practice faculty member is rewarding. Not only does it allow the faculty member to make a significant impact in the lives of future health care professionals seeking a career in academic pediatric pharmacy, but bidirectional learning also occurs, because students/residents always encourage and challenge faculty members to discover methods to improve clinical knowledge and skills as well as experience the pillars of academia (teaching, scholarship activities, clinical practice, and service responsibilities).

A variety of titles exist with responsibilities, including a combination of activities involving clinical practice, classroom and experiential teaching, research and scholarly initiatives, or service. Guidance for pursuing a faculty position begins as early as a student pharmacist orientation or may start upon enrollment in a pediatric course, APPE rotations, and/or involvement in student organizations. Residents and fellows can further develop their skills by the completion of postgraduate training programs, research projects, and participation in TLC courses. Additional tips for success as a new pediatric faculty member include participating in professional development programs, identification of a mentor, and understanding the expectations and mission of the department and colleges of pharmacy. Academic pediatric pharmacy faculty members can provide continued service to educating students and health care professionals on pediatric pharmacotherapy and can encourage lifelong success in the 4 pillars of academia.

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