Scope of contemporary pharmacy practice: Roles, responsibilities, and functions of pharmacists and pharmacy technicians

Council on Credentialing in Pharmacy

Abstract

Objective: To provide an overview of the current context and scope of pharmacy practice, the range of professional services offered by pharmacists, and the supporting role of pharmacy technicians.

Data synthesis: A synopsis of the current state of pharmacy practice as it relates to the spectrum of professional roles and responsibilities, the diversity of patient populations served, the complexities of patient services provided, and various aspects of emerging pharmacy practice is provided. The current work focuses on patient care services provided by pharmacists; it does not address all possible activities of pharmacists, such as administration and general management. This is a descriptive analysis. It does not take a position regarding future changes but is intended to serve as a foundation for understanding the relationship and alignment between the profession's various mandatory and voluntary credentials and the scope of practice continuum. The key educational and credentialing standards for pharmacists and pharmacy technicians are summarized and referenced.

Conclusion: The evolutions in health care and pharmacy practice are presenting many new opportunities for pharmacists to perform functions and provide services not considered as traditional roles. The profession of pharmacy is working to achieve a pervasive model and standard of care determined only by the needs of patients and populations. The Council on Credentialing in Pharmacy hopes that the material presented herein, including the framework for credentialing in pharmacy practice, will allow audiences to gain a better understanding of where pharmacy is today and what future pharmacy practice will look like.

Keywords: Credentialing, licensure (pharmacists), pharmacy technicians, practice standards.

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Purpose

This paper, commissioned by the Council on Credentialing in Pharmacy (CCP; see Appendix for member organizations of CCP), provides an overview of the current context and scope of pharmacy practice, the range of professional services offered by pharmacists, and the supporting role of pharmacy technicians. The paper has been developed as a companion piece to CCP's resource paper, *Credentialing in Pharmacy*.[1] To provide a link between credentialing and scope of practice, the paper also describes how credentials commonly held by pharmacists correlate with their professional scope of practice. Intended readers of this paper include members of the pharmacy profession, colleagues in other healthcare professions, students, healthcare administrators, regulators, insurers, and the general public.

This paper provides a synopsis of the current state of pharmacy practice as it relates to the spectrum of professional roles and responsibilities, the diversity of patient populations served, the complexities of patient services provided, and various aspects of emerging pharmacy practice. The paper focuses on the patient care services provided by pharmacists; it does not address all possible activities of pharmacists, such as administration and general management. The paper is a descriptive analysis. It does not take a position regarding future changes, but is intended to serve as a foundation for understanding the relationship and alignment between the profession's various mandatory and voluntary credentials and the scope of practice continuum. The key educational and credentialing standards for pharmacists and pharmacy technicians are summarized and referenced.

Introduction

The mission of the profession of pharmacy is to improve public health through ensuring safe, effective, and appropriate use of medications. Contemporary pharmacy practice reflects an evolving paradigm from one in which the pharmacist primarily supervises medication distribution and counsels patients, to a more expanded and team-based clinical role providing patient-centered medication therapy management, health improvement, and disease prevention services[2].

The Model State Pharmacy Act and Model Rules of the National Association of Boards of Pharmacy (NABP) defines the practice of pharmacy as follows:

The "Practice of Pharmacy" means the interpretation, evaluation, and implementation of Medical Orders; the Dispensing of Prescription Drug Orders; participation in Drug and Device selection; Drug Administration; Drug Regimen Review; the Practice of Telepharmacy within and across state lines; Drug or Drug-related research; the provision of Patient Counseling; the provision of those acts or services necessary to provide Pharmacist Care in all areas of patient care, including Primary Care and Collaborative Pharmacy Practice; and the responsibility for Compounding and Labeling of Drugs and Devices (except Labeling by a Manufacturer, Repackager, or Distributor of Non-Prescription Drugs and commercially packaged Legend Drugs and Devices), proper and safe storage of Drugs and Devices, and maintenance of required records. The practice of pharmacy also includes continually optimizing patient safety and quality of services through effective use of emerging technologies and competency-based training.[3]

An overview of the regulatory history and changing role of pharmacists is presented in Manasse and Speedie's 2006 paper.[4] By describing the full range of professional services currently provided, this paper seeks to clarify the contribution of pharmacists to healthcare delivery and the resulting benefits to society.

A vision for pharmacy practice has been articulated in the Joint Commission of Pharmacy Practitioners' (JCPP; see Appendix A for member organizations of JCPP) Future Vision for Pharmacy Practice 2015, which states that "Pharmacists will be the healthcare professionals responsible for providing patient care that ensures optimal medication therapy outcomes."[5] (Appendix B) The concept of "optimal medication therapy" implies that the use of medicines occurs within a system that assures the highest likelihood of achieving desired clinical, humanistic, and economic outcomes. The JCPP Vision further states that pharmacists will benefit society and be essential to the provision of effective health care by ensuring that: (a) medication therapy management is readily available to all patients; (b) desired patient outcomes are more frequently achieved; (c) overuse, underuse, and misuse of medications are minimized; (d) medication-related public health goals are more effectively achieved; and (e) cost effectiveness of medication therapy is optimized.

Existing pharmacy practice settings and their associated professional services and activities vary. The spectrum of patient care needs is broad, as patients' medication use involves self care, acute care, and long-term or chronic care. These different needs transcend all practice settings and add complexity to care delivery. The majority of pharmacists practice in community pharmacies, ambulatory care clinics, hospitals and health systems, long-term care facilities, home-care agencies, and managed-care organizations. Other practice settings or roles include the pharmaceutical industry, research, federal agencies such as the Food and Drug Administration (FDA), academia, associations, and a number of unique healthcare practices such as drug and poison information centers. JCPP organizations recognize also that pharmacy technicians are a critical part of the pharmacy workforce to implement the 2015 Vision. In many practice settings, pharmacy technicians are used to support pharmacists to manage the medication-use process (see section on Pharmacy Technicians below). Along with robotic dispensing technology, such support enables pharmacists to play a more proactive and expanded role in patient care. Pharmacy technicians are accountable to the supervising pharmacist, who is legally responsible (by virtue of state licensure) for the care and safety of patients served by the

pharmacy.

Regardless of practice setting, professional pharmacy services and activities emphasize communication, education, and information exchange with patients and their caregivers, prescribers, and other healthcare professionals. Pharmacist management of medication use provides patient-centered medication therapy and is integrated with the additional responsibilities of medication distribution, supervision of pharmacy technicians, adaptation of new pharmaceutical technologies, efficient management of systems and resources, and integration of information systems and applications, all in a rapidly changing healthcare environment. This broad scope of professional practice and the complexity of the medications managed within each of these individual practices require a pharmacy workforce that is diverse in knowledge and skills, competently trained, and adequately credentialed. The workforce must demonstrate professional judgment, ethics, attitudes, and values.

Healthcare delivery in the United States

The healthcare system in the United States is complex and faces many challenges. A number of recent reports have identified that human and economic resources within the system are stretched and, overall, not efficiently utilized.[6] As patients move through the health system, they encounter multiple providers and multiple levels of care. Traversing the healthcare system requires continuity of a patient's medication therapy and medical history to avoid errors and maximize outcomes. There is, however, an unacceptable level of error (including medication errors) in the system. The Institute of Medicine (IOM) identified five core competencies required for all health professionals to optimize patient outcomes; namely: (1) deliver patient-centered care; (2) work as part of an interdisciplinary[a] team; (3) practice evidence-based medicine; (4) apply quality improvement approaches; and (5) use information technology. The IOM stresses the need to fully utilize the knowledge and skills of each team member.[7] ([a]The term interprofessional is preferred by CCP and is used hereinafter when describing a collaborative working relationship between members of different healthcare professions, such as pharmacists, physicians, and nurses.)

Medication use statistics

Pharmaceutical preparations—including prescription and nonprescription medications—play a vital role in improving patients' quality of life. They are used to diagnose, cure, treat, or control medical conditions, prevent disease and illhealth, and eliminate or reduce symptoms. The number of prescriptions purchased from 1994 to 2005 increased 71 percent (from 2.1 billion to 3.6 billion), while the US population only grew by 9 percent. The average number of retail prescriptions per capita increased from 7.9 in 1994 to 12.4 in 2006. The population aged 65 years and over is increasing at a faster rate than the total population and 92 percent of this group have some prescription drug expenditure.[8] Globally, as people are generally healthier and living longer, the world's healthcare focus is shifting from treatment of patients with acute diseases to management of patients with chronic medical conditions. Chronic illness affects a high percentage of the US population; many patients present with co-morbidities and require complex, multi-drug therapies. Community-based treatment in the community—both acute and chronic—has escalated medication use. Higher prescription volumes attributable to a growing elderly population with multiple medications, an increased number of prescription and over-the-counter medications, direct-to-consumer advertising, increased consumer reliance on self-care, and increased outpatient surgeries have all placed the pharmacist in a more prominent position to provide more information and services to the public.

Advances in therapeutics

Advances in medical research, pharmaceutical and biomedical technologies have contributed to the development of therapies for an expanding range of medical conditions. Many therapies are complex, have high risk profiles, and require intensive monitoring. Some therapies are highly individualized or must be subject to limited distribution. Medication therapy is an essential element of healthcare delivery but the complexities of the medication use process are becoming increasingly clear. Multiple factors can have a direct impact on a patient's ability to access and adhere to medication therapy and to achieve the desired therapeutic outcomes. These factors are accentuated in chronic medication therapy. Interprofessional collaboration is crucial when developing and implementing complex therapeutic plans. The genetic composition of a patient can influence his/her response to medications and appropriate dosing. Patients from different ethnic, cultural, or social backgrounds may have different perceptions, beliefs, behaviors, or practices relevant to disease states or medication therapy, which can impact the success or failure of patient outcomes. Cultural issues may also impact pharmacist-patient or pharmacist-caregiver communication. Beyond basic language barriers, pharmacists must be able to accurately assess the ability of the patient and/or caregiver to obtain, interpret, and understand basic health information and services (their "health literacy") to ensure that all communications are appropriate and understood. A patient must be able to use available information and be aware of how to access and use services to enhance their health. However, an individual's health literacy can impact the achievement of desired patient outcomes. Such situations are faced daily by pharmacists, and necessitate the growing area of education and training in cultural competency. Pharmacists are being trained to deliver culturally competent care as part of their efforts to optimize patient outcomes and eliminate disparities that exist in the healthcare delivery system.[9] Patients on a reduced budget, those without any income, and those who are homeless are increasing in number and often have limited access to the healthcare system. Such patients often need help to access

indigent-care medication programs or pharmaceutical manufacturers' medication programs.

Medication therapy management

Patients may require a combination of information, education, guidance, and "coaching" about their medications. Pharmacists have a broad knowledge base to appropriately assess and respond to a patient's medication therapy needs, thereby contributing to the interprofessional management of patients and optimal patient care. Medication therapy management (MTM) is a partnership of the pharmacist, the patient or their caregiver, and other health professionals that promotes the safe and effective use of medications and helps patients achieve the targeted outcomes from medication therapy. In 2004, eleven national pharmacy organizations developed a consensus definition for medication therapy management services (MTMS) as follows:

Medication therapy management is a distinct service or group of services that optimize therapeutic outcomes for individual patients. Medication therapy management services are independent of, but can occur in conjunction with, the provision of a medication product.[10,11]

MTM encompasses a broad range of professional activities and responsibilities within the licensed pharmacist's, or other qualified healthcare provider's, scope of practice. Examples of medication management therapy services are provided in Appendix C. A more comprehensive framework for the development of MTM programs is provided in Medication Therapy Management in Pharmacy Practice: Core Elements of an MTM Service Version 2.0 released in March 2008 by the American Pharmacists Association (APhA) and the National Association of Chain Drug Stores (NACDS) Foundation.[12] The introduction of a prescription drug benefit under Medicare Part D increased the recognition that pharmacists play an active role in the prevention and resolution of medication-related problems and medication management, thereby contributing to the optimization of patient therapeutic outcomes.[13] Other organizations committed to improved healthcare delivery have recognized the contribution of pharmacists in this regard.[14] While Medicare Part D provides an excellent example of an MTM benefit, such services are often provided by pharmacists to patients other than those covered by Medicare. MTM service capability is supported by the recent revisions to the accreditation standards for professional degree programs in pharmacy. To ensure that pharmacists have this essential clinical management expertise, these standards emphasize the achievement by graduates of competency in the development and maintenance of individual patient-care plans.[15]

Implicit in the ability of a pharmacist to obtain accurate disease and medication history is a thorough understanding of the primary medical problem, co-morbidities, and pharmacologic effects of the individual patient medication regimen. In cases where patients are receiving multiple medications, an in-depth understanding of drug interactions is also required. In the area of medication-related problems, pharmacists have developed expertise in monitoring the pharmacologic effects of medications for certain disease states including, but not limited to, diabetes, asthma, hypertension, seizures, hyperlipidemia, anticoagulation, and infectious diseases. These initiatives provide an "early warning" system that identifies patients with sub-optimal treatment responses and those patients who may experience excessive drug effects, drug interactions, adverse drug effects, and/or drug toxicity. Studies have demonstrated the clinical and economic benefits of MTM services provided by pharmacists.[16]

Pharmacists have assumed an expanded role in medication safety, prevention of medication-related problems, disease prevention, and wellness programs. In the area of disease prevention and health promotion, pharmacists have developed practices such as those that reduce morbidity from obesity, osteoporosis, heart failure, hypertension, diabetes, and other chronic medical conditions, as well as patient habits and behaviors that impact health, such as smoking. The rapid, dramatic advances in medication therapy over recent decades have also created a niche for pharmacy practitioners who specialize in specific kinds of treatment and aspects of care.

Practice-based research projects

Community-based initiatives, such as the Asheville Project, have demonstrated that, by providing intensive education and ensuring that patients are using their medications correctly, pharmacists can contribute to improved patient outcomes, lowered total healthcare costs, a reduction in number of sick days taken, and increased satisfaction with pharmacist services. With the support of a "pharmacist coach," patients can become effective at self-managing a chronic disease. The Asheville Project began in 1996 as an effort by a self-insured employer to provide education and personal oversight for employees with chronic health problems such as diabetes, asthma, hypertension, and high cholesterol. During a six-year period, cardiovascular and cerebrovascular (CV collectively) medication use increased nearly threefold, but CV-related medical costs decreased by 46.5 percent. CV-related medical costs decreased from 30.6 percent of total healthcare costs to 19 percent. A 53 percent decrease in risk of a CV event and greater than 50 percent decrease in risk of a CV-related emergency department/hospital visit were also observed[17].

Using a similar approach to the Ashville Project, the Diabetes Ten City Challenge was launched in 2005, involving employers in ten distinct geographic locations. Using incentives, employers encouraged people to manage their diabetes with the help of pharmacist coaches, physicians, and community health resources. Results to date indicate that this collaborative approach results in (a) savings of approximately $918 per employee in total healthcare costs for the initial year, with even greater savings in subsequent years, (b) return on investment of at least 4:1 beginning in the second year, (c) a 50 percent reduction in absenteeism and fewer workers' compensation claims, (d) high employee satisfaction (95 percent approval for pharmacist care) and

improved quality of life, and (e) employees saving an average of $400–600 per year with incentives such as waived co-pays.[18]

Numerous studies of pharmacist-provided patient care services show that increased access to and adherence with prescription drug therapies, reduced medication errors and other harms, improved outcomes, and reduced costs all result from the pharmacist's intervention.[19] Launched in 2007, Project Destiny—a joint effort of the American Pharmacists Association (APhA), the National Association of Chain Drug Stores (NACDS), and the National Community Pharmacists Association (NCPA)—seeks to validate community pharmacy's future role in the delivery of health care as a valuable and integral component, accepted and recognized by patients, payers, and policymakers for the patient care services delivered. The initiative aims to position the pharmacist as the medication expert and the key provider of MTM services to patients, thereby reinforcing the role of the pharmacist as a key contributor to a patient's overall health and to substantial reductions of overall healthcare costs.

Pharmacy practice in the United States

In any health system, it is essential that patients have access to reliable information and competent professional care. After physicians and nurses, pharmacists constitute the third largest group of health professionals. Pharmacists held about 253,000 jobs in May 2007 and employment of pharmacists is expected to grow by 22 percent between 2006 and 2016, which is much faster than the average for all occupations.[20,21] Gallup polls indicate that pharmacists consistently rate as one of the most trusted professionals.[22] They are readily accessible and members of the public see them twelve to fifteen times a year, compared with three to four visits to a physician.[23] In its publication Health, United States 2004, the Centers for Disease Control and Prevention (CDC) quoting data from a 2000 survey, stated that 44 percent of Americans reported taking at least one drug in the past month and 17 percent were taking three or more.[24] Persons over the age of 65 years consume twice as many prescription medicines as do persons under the age of 65 years.[25] There are approximately 100,000 nonprescription products on the US market and in 2004 $15.1 billion was spent on nonprescription medications.[4] In 2002, prescription drugs represented the third-highest type of healthcare expenditure in the US, behind hospital costs and physician fees.[26,27] In 2007, total prescription drug expenditures reached approximately $286.5 billion.[28]

Pharmacists work in a wide range of settings, the majority of which provide services directly to patients. In 2006, about 62 percent of pharmacists worked in community pharmacies, about 23 percent worked in hospitals, and the remainder worked in nontraditional settings. Pharmacy practice varies, with more traditional (dispensing-focused) practice settings intermingled with approaches with expanded patient care services in, for example, community, hospital, and health-system settings. State practice regulations that determine the scope of pharmacy practice, differ somewhat between states. This ultimately determines how progressive pharmacy practice can be from state to state. NABP's Model State Pharmacy Act and Model Rules provides state boards of pharmacy with model language that may be used when developing state laws or board rules for regulating the practice of pharmacy and the distribution of drugs and related devices. NABP also revises and publishes annually the NABP Survey of Pharmacy Law, which provides summary data about topical issues in pharmacy, including prescribing and dispensing authority, pharmacy technicians, the facsimile and electronic transmission of prescriptions, and patient counseling requirements.

Competency-based education

The mission of pharmacy education is to prepare graduates who provide patient-centered care that ensures optimal medication therapy outcomes and provides a foundation for specialization in specific areas of pharmacy practice; to participate in the education of patients, other healthcare providers, and future pharmacists; to conduct research and scholarly activity; and to provide service and leadership to the community.[29] For pharmacist education, the American Association of Colleges of Pharmacy (AACP) Center for the Advancement of Pharmaceutical Education (CAPE) Educational Outcomes provide a framework that integrates professionalism, interprofessional practice, ethical attitudes and behaviors, and basic science across three expected educational outcomes: Pharmaceutical Care[b], Systems Management, and Public Health to meet this mission mandate.[30] ([b]The term Patient Care is used hereafter.)

The Educational Outcomes are the competencies that should be achieved by a graduate of a professional degree program in pharmacy prior to entering the work force. A pharmacist is able to provide Patient Care (Outcome 1) in cooperation with patients, prescribers, and other healthcare practitioners by utilizing sound therapeutic principles and evidence-based data, while always emphasizing legal, ethical, social, economic, and professional issues surrounding technology and evolving clinical sciences. Also, upon graduation, a pharmacist is expected to be competent in Systems Management (Outcome 2). Systems management includes managing resources in cooperation with patients, prescribers, and other healthcare providers, as well as administrative and supportive personnel (eg, pharmacy technicians) to promote health and provide, assess, and coordinate medication distribution. Finally, a pharmacist must also be able to promote Public Health (Outcome 3) by improving health, wellness, and disease prevention in cooperation with patients, communities, at-risk populations, and other interprofessional teams of healthcare providers.

The recently revised Accreditation Council for Pharmacy Education (ACPE) Standards for accreditation of the professional degree in pharmacy—the Doctor of Pharmacy (PharmD)—adopted the CAPE Educational Outcomes with minor modifications. (Table 1) The North American Phar-

Table 1. Alignment of competency and credentialing frameworks: ACPE Standards, AACP's CAPE Outcomes, and NABP's NAPLEX Blueprint

ACPE Standard 12: Professional Competencies and Outcome Expectations Professional pharmacist competencies that must be achieved by graduates through the professional degree program curriculum are the ability to:	**AACP CAPE Educational Outcomes 2004**		**NABP NAPLEX Blueprint**	
1. Provide patient care in cooperation with patients, prescribers, and other members of an interprofessional health care team based upon sound therapeutic principles and evidence-based data, taking into account professional issues, emerging technologies, and evolving biomedical, pharmaceutical, social/behavioral/administrative, and clinical sciences that may impact therapeutic outcomes.	Outcome 1: Pharmaceutical Care	Provide patient-centered care Provide population-based care	Area 1	Assure Safe and Effective Pharmacotherapy and Optimize Therapeutic Outcomes
2. Manage and use resources of the health care system, in cooperation with patients, prescribers, other healthcare providers, and administrative and supportive personnel, to promote health; to provide, assess, and coordinate safe, accurate, and time-sensitive medication distribution; and to improve therapeutic outcomes of medication use.	Outcome 2: Systems Management	Manage human, physical, medical, informational, and technological resources Manage medication use systems	Area 2	Assure Safe and Accurate Preparation and Dispensing of Medications
3. Promote health improvement, wellness, and disease prevention in cooperation with patients, communities, at-risk populations, and other members of an interprofessional team of health care providers.	Outcome 3: Public Health	Assure the availability of effective, quality health and disease prevention services Develop public health policy	Area 3	Provide Health Care Information and Promote Public Health

These professional competencies must be used to guide the development of stated student learning outcome expectations for the curriculum. To anticipate future professional competencies, outcome statements must incorporate the development of the skills necessary to become self-directed lifelong learners.

macist Licensure Examination (NAPLEX) is the principal licensure examination that all students who graduate from an accredited professional degree program in pharmacy must pass to obtain licensure and practice as a pharmacist. The NAPLEX Blueprint, developed from regularly updated practice analyses, comprises detailed competency statements in three main areas: (1) Assure Safe and Effective Pharmacotherapy and Optimize Therapeutic Outcomes; (2) Assure Safe and Accurate Preparation and Dispensing of Medications; and (3) Provide Healthcare Information and Promote Public Health[31]. The blueprint reflects the knowledge, judgment, and skills expected to be demonstrated by an entry-level pharmacist to protect the health and welfare of their patients. Table 1 illustrates how the ACPE Standards, CAPE Educational Outcomes, and the NAPLEX Blueprint mirror each other. The close alignment of the competency frameworks of AACP, ACPE, and NABP serves the profession's and patients' needs well by addressing both current and evolving practice activities.

Effective in 2000, all students enrolled in a professional Doctor of Pharmacy degree program are required to complete a minimum of six years of post-secondary education, up from the minimum of five years required by previous accreditation standards, which expired in 2004. The curricular change to the Doctor of Pharmacy degree provided for increased clinical training. One of the primary reasons for this additional clinical training was to ensure that pharmacists could work more effectively with physicians, nurses and other healthcare professionals. The ongoing accreditation review of the degree programs of colleges and schools of pharmacy, providers of continuing education, and residency training programs, and the expansion of post-licensure education and training opportunities encourage a continued focus on the emerging roles and practice competencies that pharmacists require as new pharmacy practices are established.

Tasks and functions of pharmacists

On a regular basis, there have been collaborative initiatives within the profession to analyze and document the professional activities of pharmacists. The last of these was the Scope of Pharmacy Practice Project (1992–1994).[32] Following the third JCPP Pharmacy in the 21st Century Conference in 1994, a collaborative effort of ten national pharmacy organizations[c] led to the development of the Pharmacist Practice Activity Classification (PPAC), a hierarchical categorization of pharmacist activities.[33] (Table 2) The PPAC also includes activities that are either delegated by pharmacists to technicians or are carried out by automated systems. ([c]Academy of Managed Care Pharmacy, American Associa-

Table 2. Pharmacist Practice Activity Classification (PPAC) domains and classes

Domain	Class
A. Ensuring Appropriate Therapy and Outcomes	A.1. Ensuring appropriate pharmacotherapy A.2. Ensuring patient's understanding/adherence to his or her treatment plan A.3. Monitoring and reporting outcomes
B. Dispensing Medications and Devices	B.1. Processing the prescription or drug order B.2. Preparing the pharmaceutical product B.3. Delivering the medication or device
C. Health Promotion and Disease Prevention	C.1. Delivering clinical preventive services C.2. Surveillance and reporting of public health issues C.3. Promoting safe medication use in society
D. Health Systems Management	D.1. Managing the practice D.2. Managing medications throughout the health system D.3. Managing the use of medications within the health system D.4. Participating in research activities D.5. Engaging in interdisciplinary collaboration

tion of Colleges of Pharmacy, American College of Apothecaries, American College of Clinical Pharmacy, American Pharmacists Association, American Society of Consultant Pharmacists, American Society of Health-System Pharmacists, National Association of Boards of Pharmacy, National Association of Chain Drug Stores, National Community Pharmacists Association)

The three competency frameworks and the PPAC also align closely with the five core competencies applicable to all healthcare professionals and which are identified by the IOM, namely: (1) delivering patient-centered care, (2) working as a part of interprofessional teams, (3) practicing evidence-based medicine, (4) focusing on quality improvement, and (5) using information technology.[7] The three broad competency areas—Patient Care, Systems Management, and Public Health—also reflect a framework that is used in this document to describe the areas of practice of pharmacists. The primary focus of this paper is, however, Patient Care, ie, professional services provided directly to patients. Services provided by pharmacists in the other two areas (Systems Management and Public Health) will be described in lesser detail.

Credentialing in pharmacy

As described in CCP's resource paper, *Credentialing in Pharmacy*, post-licensure education and training opportunities for

Table 3. Required and elective educational outcomes for postgraduate year one (PGY1) pharmacy residency programs

Required Outcomes:	
Outcome R1	Manage and improve the medication-use process
Outcome R2	Provide evidence-based, patient-centered medication therapy management with interdisciplinary teams
Outcome R3	Exercise leadership and practice management skills
Outcome R4	Demonstrate project management skills
Outcome R5	Provide medication and practice-related education/training
Outcome R6	Utilize medical informatics
Potential Electives:	
Outcome E1	Conduct pharmacy practice research
Outcome E2	Exercise added leadership and practice management skills
Outcome E3	Demonstrate knowledge and skills particular to generalist practice in the home care practice environment
Outcome E4	Demonstrate knowledge and skills particular to generalist practice in the managed care practice environment
Outcome E5	Participate in the management of medical emergencies
Outcome E6	Provide drug information to healthcare professionals and/or the public
Outcome E7	Demonstrate additional competencies that contribute to working successfully in the healthcare environment

pharmacists have expanded dramatically in the past few decades. This trend reflects the enhanced and expanded roles of pharmacists in response to the changing societal needs outlined earlier. A parallel development has been the emergence of more formal and structured education and training programs for pharmacy technicians, accreditation of such training programs, and nationally recognized certification. Underpinned by state board-mandated continuing education activities that aim to ensure that all practitioners remain competent to practice, additional offerings support the professional development and enhanced competency of pharmacists in a variety of ways. Some are specific to pharmacists, while others are offered to multiple health professionals. (Appendix E, Figure 7) The recognition of pharmacy specialty practices in specific disease states led to agreement

Table 4. Pharmacy practice areas for postgraduate year two (PGY2) residencies

Educational Goals and Objectives have been developed for the following areas of pharmacy practice:	
Ambulatory Care	Medication-Use Safety
Critical Care	Nuclear Medicine
Drug Information	Nutrition Support
Geriatrics	Oncology
Health-System Pharmacy Administration	Pediatrics
Infectious Diseases	Pharmaco-therapy
Informatics	Psychiatry
Internal Medicine	Solid Organ Transplant

that standard competencies should be demonstrated on a national basis with regard to "best practices".[34] Disease-specific and specialized training and certification were initiated through the National Institute for Standards for Pharmacist Credentialing (NISPC),[d] the Board of Pharmaceutical Specialties (BPS), and individual ACPE-accredited Certificate Programs (eg, in HIV/AIDS, immunization, and diabetes).[e] Full details of these programs are provided in *Credentialing in Pharmacy*. Post-licensure training programs and credentials are (1) competency-based, (2) developed on the basis of a comprehensive practice analysis in the relevant areas, and (3) offered or accredited by organizations that adhere to accepted principles and practices to assure quality, integrity, and validity.[1] As examples, brief overviews of pharmacy practice residencies and specialty certification are provided below. ([d]NISPC Certified Disease Manager Certification program expired on December 31, 2008. [e]With effect from January 1, 2009, ACPE implemented new accreditation standards for providers of continuing pharmacy education and no longer maintains separate accreditation standards for providers of Certificate Programs.)

Residency training

Residency training programs are one year in length and provide an environment and structure for accelerating growth and experience beyond entry-level professional competence through supervised practice under the guidance of model practitioners (preceptors) in "real-world" settings. Residents are exposed to a wide range of patients with multiple disease states and work with a variety of health professionals, thereby advancing their clinical, interpersonal, and leadership skills. The first postgraduate year of pharmacy residency training focuses on managing the medication use process and providing optimum medication therapy outcomes for patients with a broad range of disease states. The second year of postgraduate residency training focuses on a specialized area of practice and more in-depth training and experience.

Established in 1962 and maintained by the American Society of Health-System Pharmacists (ASHP), accreditation standards for Post-Graduate Year One (PGY1) pharmacy residencies (previously referred to as "pharmacy practice residencies") and Post-Graduate Year Two (PGY2) pharmacy residencies (previously referred to as "specialized residency training") incorporate required and elective educational out-

Table 5. Domains and content outlines for BPS specialty examinations

	Nuclear	**Nutrition Support**	**Oncology**	**Pharmaco-Therapy**	**Psychiatric**
Domain 1	Drug Order Provision (66% of the examination)	Clinical Practice/Provision of Individualized Nutrition Support to Patients (68%)	Clinical Skills and Therapeutic Management (60%)	Patient-Specific Pharmacotherapy (55%)	Clinical Skills and Therapeutic Management (65%)
Domain 2	Health and Safety (24%)	Management of Nutrition Support Operations (20%)	Generation, Interpretation, and Dissemination of Information (20%)	Retrieval, Generation, Interpretation and Dissemination of Knowledge in Pharmacotherapy (30%)	Education and Dissemination of Information (25%)
Domain 3	Drug Information Provision (10%)	Advancement of Nutrition Support Practice (12%)	Guidelines, Policies, and Standards (15%)	Health System-Related Pharmacotherapy (15%)	Clinical Administration (10%)
Domain 4			Public Health and Advocacy (5%)		

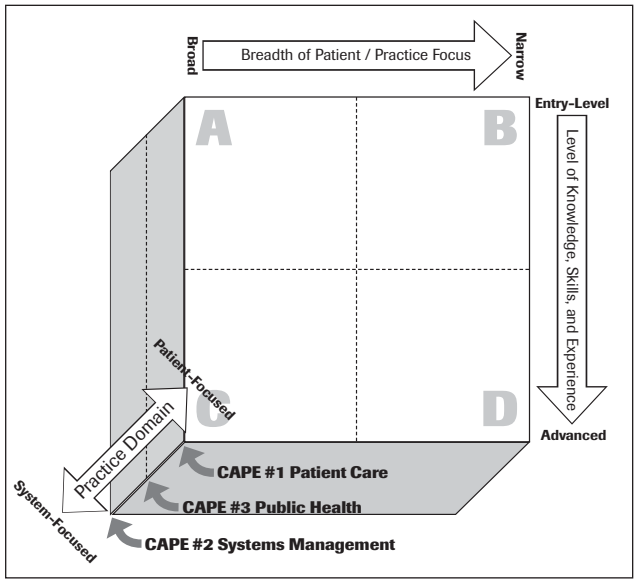

Figure 1. Scope of pharmacy practice and professional competencies in the U.S.

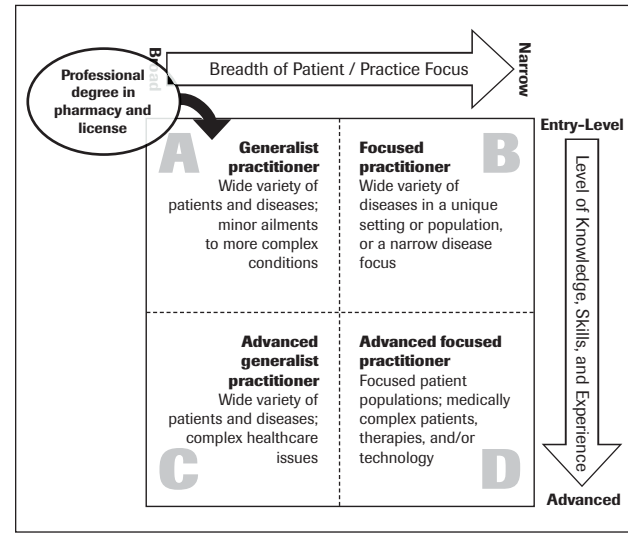

Figure 2. Practitioners in direct patient care

comes, goals, and objectives. These outcomes build upon the PharmD competencies and augment the IOM competencies. A PGY1 pharmacy residency must be completed before going on to a PGY2 pharmacy residency. The educational outcomes for PGY1 residencies are listed in Table 3. PGY2 educational outcomes are more extensive and each specialized area of training has its own specific outcomes. Table 4 lists the practice areas for which PGY2 educational goals and objectives have been developed.[35]

Specialty certification

In pharmacy—as in all healthcare practices—specialization has become essential to optimal patient care. The evolution of specialists in pharmacy is much shorter than in medicine and other healthcare professions. Established in 1976 by the American Pharmacists Association, the Board of Pharmaceutical Specialties (BPS) currently certifies pharmacists in five specialties: nuclear pharmacy, nutrition support pharmacy, oncology pharmacy, pharmacotherapy, and psychiatric pharmacy. The recognition of each specialty is the result of collaboration between BPS and one or more pharmacy organizations. Each specialty examination has a separate Content Outline validated through a national survey of pharmacist specialists. The Content Outlines provide detail on the major areas ("domains") of responsibility for a specialist, the tasks that are required to fulfill these responsibilities, and the knowledge that underlies the performance of these tasks. For example, the Content Outline for the Pharmacotherapy Specialty is divided into three domains: (1) patient-specific pharmacotherapy; (2) retrieval, generation, interpretation and dissemination of knowledge in pharmacotherapy; and (3) health system-related pharmacotherapy.

Table 5 provides the domains for the five specialties. Each certification examination question is linked to a specific domain, task, and knowledge statement. Certification examinations are developed to be psychometrically sound and legally defensible. In 1997, BPS introduced the designation of "Added Qualifications" to denote that an individual has demonstrated an enhanced level of training and experience in one segment of a BPS-recognized specialty. Infectious Diseases and Cardiology are the two added qualifications for the pharmacotherapy specialty currently recognized by BPS. BPS believes that a new specialty, focused in the area of ambulatory or primary care pharmacy practice, might be an appropriate addition to the five specialty certifications offered and introduction of such a specialty is under active consideration. Further details regarding specialty certification can be found on the BPS Website http://www.bpsweb.org/08_Resources.html.

A framework for credentialing in pharmacy practice

The CCP has embraced a conceptual framework that articulates the relationship between the scope of a pharmacist's practice and his/her credentials and post-licensure education and training. The framework is described in detail in Appendix E. Using a three-dimensional model to encompass the three major domains of pharmacy practice described earlier—Patient Care, Systems Management, and Public Health—the framework illustrates: (1) how pharmacists' careers may evolve after completion of professional education, licensure, and entry to practice; (2) the post-graduate education and training activities in which they may participate; (3) the credentials/certifications they may earn; and (4) the relationship between credentialing, broad competency areas, scope of practice, and patient populations served.

The Patient Care domain of the framework depicts pharmacists as falling into one of four quadrants in the model: (A) Generalist Practitioners; (B) Focused Practitioners; (C) Advanced Generalist Practitioners; and (D) Advanced

Focused Practitioners. (Figures 1 and 2) This "differentiation,"—based on breadth of practice/patient focus and level of knowledge, skills, and experience—is expanded upon in the next section where the roles, responsibilities and functions of practicing pharmacists are described.

Pharmacists in patient-care roles

Generalist practitioners

"Generalist practitioners" (Figure 2, Quadrant A) care for patients with a wide variety of medical conditions and diseases, ranging from minor ailments to complex acute and chronic conditions. They may also provide consultation regarding the healthcare issues and needs of individuals seeking advice and those for whom an intervention is warranted to promote good health, prevent the development of disease, or avoid the consequences of lifestyles and behaviors that pose health risks. The practice settings for these pharmacists are primarily community pharmacies, ambulatory clinics, hospitals, and health systems. It is envisioned that the pharmacy services for the large majority of patients and individuals can be provided by generalist practitioners; hence, this is where there is the shortest supply and greatest need for pharmacists.

Community-based care

The flow of activities that is typically associated with medication management in a community pharmacy or ambulatory clinic practice is shown in Figure 3; it depicts a pharmacist's responsibilities for the provision of direct patient care. New prescriptions for acute illness and refills of medications for chronic conditions are accompanied by a full medication (prescription and nonprescription) and allergy history. Pharmacists should conduct a health-literacy assessment and then provide individualized counseling, education, and "coaching" to ensure that the patient and/or the patient's caregiver is aware of the identity of the product, the indications and directions for use, storage requirements, side effects, long-term toxicity, drug interactions, food interactions, and medication adherence factors.

Community pharmacy is the practice setting that the public primarily envisions when pharmacy practice is discussed. The provision of medication for ambulatory patients is the primary responsibility of community pharmacy practitioners and the volume will increase as a result of an aging population and the trend toward managing more acute conditions and acute exacerbations of chronic conditions in the ambulatory environment. The complexity and sophistication of the medications used in the ambulatory setting, coupled with the increasing number of ambulatory patients, suggests that pharmacists in community pharmacies will become an even more essential access point for acquisition of healthcare services. This trend will continue despite the fact that an increasing number of patients receive their medications and medication information from an institutional or health system-affiliated pharmacy or a pharmacy that is located within an organized primary care medical practice.

Institution-based care

The policies and procedures in the acute care or long-term care institutional settings are analogous to but slightly different from those depicted for ambulatory settings. In these settings there is often active participation by pharmacists in the medication selection decision as part of the medical care team. This collaboration precedes the generation of the medication orders, which are interpreted and processed by other pharmacists to ensure accurate medication selection and the development of monitoring plans to assure that optimal outcomes—including patient safety—are achieved (Figure 4). Pharmacists in the medication distribution process have a responsibility for the training and supervision of pharmacy technicians, efficient use of information technology, and application of management skills that allow for patient priorities to be set in daily practice activities. In addition to collaborating with other health professionals in the medication selection process and monitoring drug distribution, pharmacists have responsibilities to assure that patients receive the safest and best therapy possible, are educated about their medications, and are provided strategies to enhance their compliance with medication regimens. Pharmacists provide consultation and recommendations to physicians, nurses, physician assistants, and other healthcare professionals regarding approved and off-label indications, dosing and administration guidelines, drug interactions, chemical incompatibilities, therapeutic drug-monitoring approaches to avoid toxicity and maximize effectiveness, adverse-effect monitoring and prevention, and avoidance of therapeutic duplication as the result of poly pharmacy. Dosing might have to be adjusted according to the patient's age, disease, renal function, or hepatic function. In a hospital a variety of routes of administration may be available including intravenous, intramuscular, subcutaneous, irrigation, nasogastric tube, oral, or targeted therapies. When this scope of pharmacy services is present, the pharmacist becomes a critical contributor to direct patient care through interactions with providers on decision-making processes for drug regimens, formulary issues, and optimal drug therapies to meet the needs of the individual patient.

Many factors influence the type of activities for the pharmacist in a hospital setting. Some of these factors include: the size of the hospital, the services provided by the hospital (eg, pediatrics, oncology, transplant, trauma center), academic affiliations with the hospital, the presence of pharmacy residency programs, geographic location, affiliated health insurance programs, related ambulatory clinics, the level of deployment of pharmacy technicians and the extent of integration of information systems and technology such as robotics, automated dispensing, and computerized physician order entry (CPOE).

The nature of acute care requires that pharmacists in this setting have a broad knowledge base in parenteral medications, intravenous fluid and nutritional therapy, chemistry, physiology, and pathophysiology. Pharmacists are involved in determining chemical compatibilities, infu-

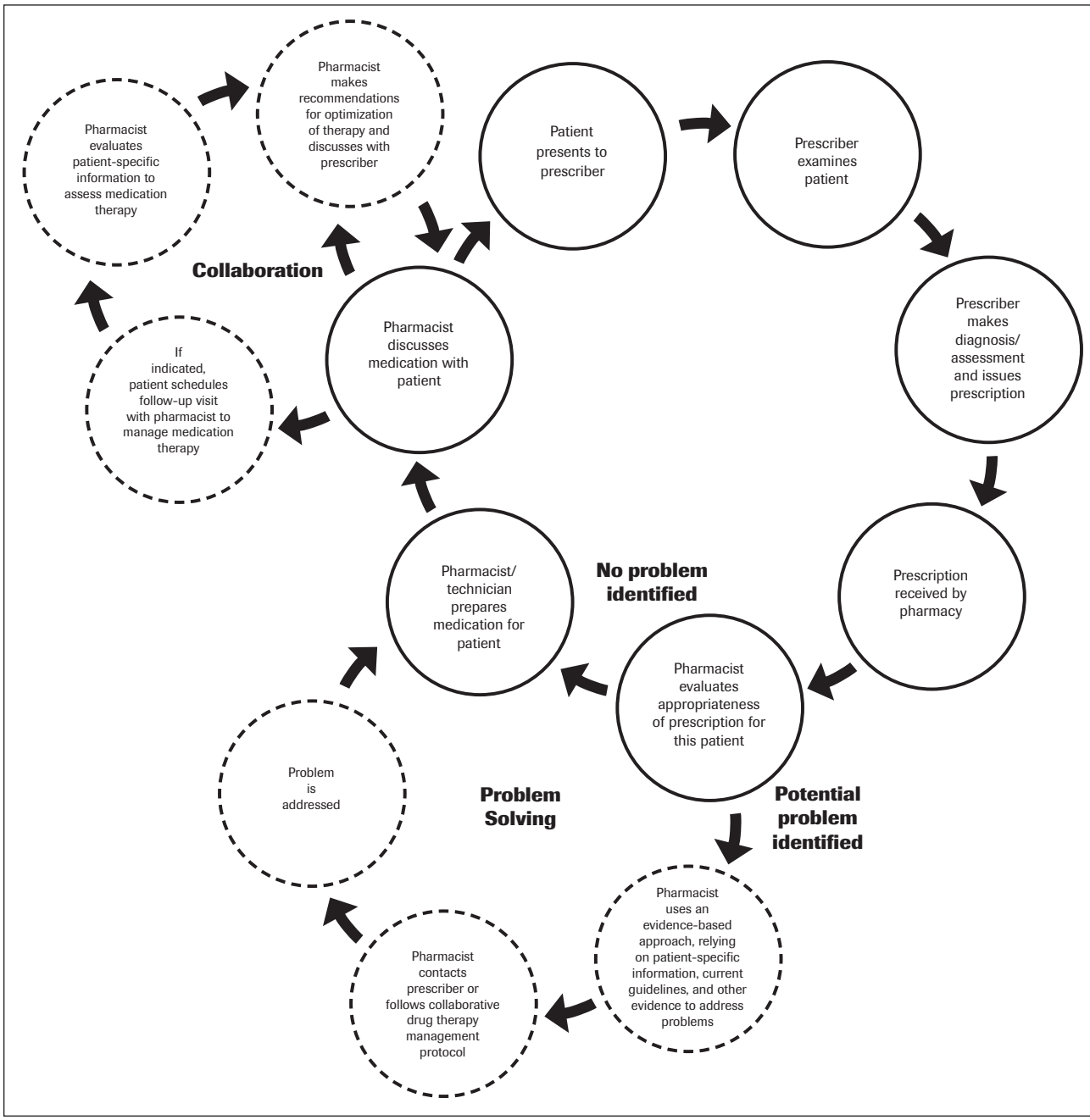

Figure 3. Flow diagram depicting steps to optimize medication therapy for ambulatory patients

sion rates, and sequencing of multiple medications that may need to be infused intravenously into a patient. Additionally, pharmacists interpret a wide array of laboratory and imaging tests to monitoring drug therapy. Patients in hospitals receive a high number of medications, and have frequently changing medical conditions that increase the opportunity for drug interactions and adverse side effects. The pharmacists must always be reviewing medications to help assure the best outcomes for the patient. Recent advances in informatics facilitate more efficient access to drug information, lab information, and patient data so that all pharmacists provide drug information to a variety of healthcare practitioners.

Population-based care

Pharmacists also participate in medication management through involvement in the pharmacy and therapeutics (P&T) committees of hospitals, health systems, and man-

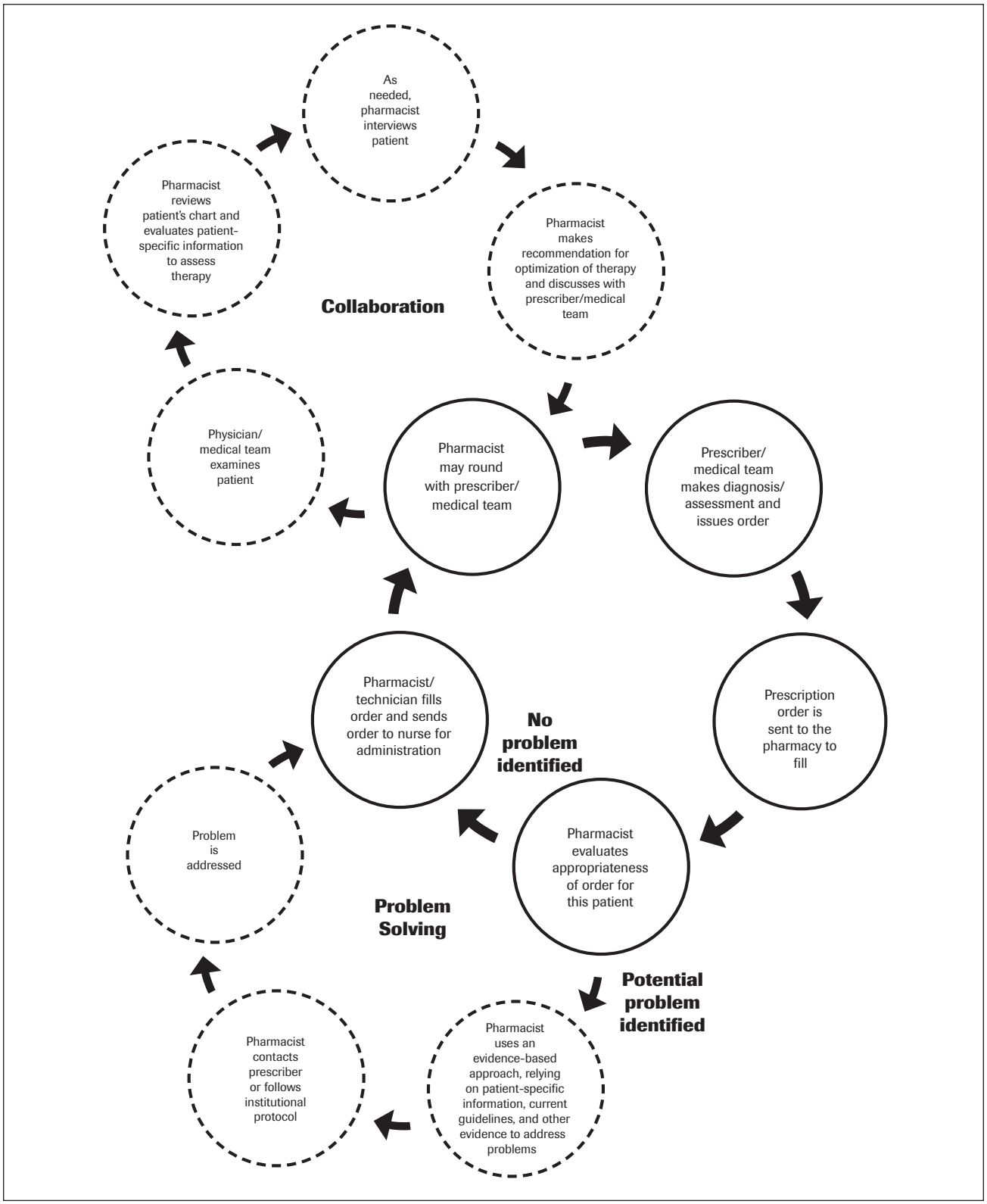

Figure 4. Flow diagram depicting steps to optimize medication therapy for hospitalized patients

aged-care organizations. A key aspect of this role for pharmacists is involvement in the development of protocols, guidelines, and formularies for directing safe and effective use of medications while in the hospital. While patient safety and improved healthcare outcomes are the primary focus, pharmaco-economic aspects of drug therapy decision making and contract pricing—generally coordinated by pharmacists—are also integral to the pharmacy and therapeutics committee process; these in turn facilitate cost containment within the health system. Recent regulatory requirements have expanded the role of the pharmacist in risk management and regulatory compliance.[14] Furthermore, the importance of continuity of care has led to an increased need to have a pharmacist in the emergency department, and to evaluate medication histories upon admission to hospital and provide medication counseling prior to discharge. In this role, pharmacists address acute-care needs and help to transition patients into and out of the hospital. Other roles for pharmacists in hospital and health-system practice include managing pain, coordinating reimbursement for indigent-care programs, preparing for bioterrorism, supervising investigational drug distribution, and participating in clinical research.

A pharmacist practicing in a medical clinic or ambulatory clinic setting is often an active participant in an interprofessional team that may include physicians, mid-level providers, medical residents, students, nurses, social workers, and others. In many ambulatory settings, pharmacists directly collaborate with members of the healthcare team while, in others, written consultations or patient progress notations may be the predominant means of communication. Generalist practitioners in ambulatory settings assist patients by reviewing their prescription, nonprescription, and herbal medications, as well as nutritional therapies. They may also provide disease state specific management education to patients, train them in the use of devices and tools to monitor their disease state(s), and regularly follow-up with patients and/or their caregivers to verify adherence to the medication regimen. Providing such comprehensive services to selected communities has been associated with more efficient patient care and positive clinical, humanistic, and economic outcomes.[36]

Pharmacists in over 45 states and territories can now serve as "providers" and directly interact with patients during their clinic visit or after, participate in medical chart review and documentation, and serve an essential role in the structured prescriber-directed medical team review of patients.[37] In this type of pharmacy practice, patient evaluation, monitoring, medication recommendation, medication modification, and formulary management with follow-up are facilitated with a collaborative drug therapy management (CDTM) agreement. The objectives of CDTM are to better coordinate drug prescribing, dispensing, administration, monitoring, and dosage adjustment and avoid drug-related problems that contribute to less than optimal patient outcomes and increased healthcare costs.[38] CDTM agreements typically specify what pharmacists are authorized to do (generally by physicians), such as selection of medications for identified medical conditions, adjustment of dosage regimens based on patient's response to therapy, monitoring of key vital signs, authorizing prescription refills, providing drug information, assessing patient compliance, drug policy development, and development and evaluation of therapeutic management policies. Collaborative practice agreements have covered a variety of patient service areas, most commonly anticoagulation, monitoring and dosage adjustment, pain management, emergency contraception, and disease-state management of asthma, diabetes, and hyperlipidemia.[39] The benefits of physicians and pharmacists working collaboratively to improve patients' quality of life and reduce medication-related adverse effects have been acknowledged by several physician and medical organizations.[40,41]

The Veterans Affairs (VA) Health System and several other regional healthcare organizations have developed models that maximize the contribution of a pharmacist's interaction with ambulatory patients and also emphasize the clinical integration of pharmacotherapy expertise.[42] An example of CDTM activities undertaken by pharmacists practicing in an ambulatory care setting is provided in Appendix D. The VA approach has allowed the VA care delivery system to function efficiently and economically while enhancing patient care. Within the VA system, the pharmacist acts as an extension of the physician and is able to implement medication and dosage changes as well as ensure continuity of care by prescribing medication and directing medication dispensing. This model has been replicated in many states that have adopted collaborative practice initiatives and has been shown to improve patient safety, quality of life, and economic markers.[42]

Many generalist practitioners in any practice setting—even while spending the majority of their practice dealing with a broad range of patients and medical conditions—may have developed expertise in a specific area. This may be reflected in the provision of more specialized services at their practice site. These specialized services may be focused on one disease state (such as asthma) or on public health initiatives (such as smoking cessation or the provision of immunizations). Currently, 49 states have adopted regulations that allow pharmacists to administer immunizations. The laws vary in depth and breadth since some states (eg, Virginia) allow pharmacists to administer all immunizations including travel specific vaccines, whereas other states (eg, Delaware) only allow pharmacists to deliver influenza and pneumococcal vaccines. In states where pharmacists are permitted to immunize, the percentage of people immunized is increasing toward the goals of Healthy People 2010.[43]

Mail-service pharmacy

Some patients receive their medications—especially refills for medications used for chronic medical conditions—from mail-service pharmacies, which are used by some health plans, prescription benefit management companies (PBMs),

Table 6. Credentialing programs for pharmacists

Program	Credentialing Agency	Credentials Earned
Anticoagulation	National Institute for Standards for Pharmacist Credentialing (NISPC)*	Certified Disease Manager (CDM)
	National Certification Board for Anticoagulation Providers (NCBAP)	Certified Anticoagulation Care Provider (CACP)
Asthma	National Institute for Standards for Pharmacist Credentialing (NISPC)*	Certified Disease Manager (CDM)
	National Asthma Educator Certification Board (NAECB)	Certified Asthma Educator (AE-C)
Diabetes	National Institute for Standards for Pharmacist Credentialing (NISPC)*	Certified Disease Manager (CDM)
	National Certification Board for Diabetes Educators (NCBDE)	Certified Diabetes Educator (CDE)
	American Nurses Credentialing Center (ANCC)	Board Certified-Advanced Diabetes Management (BC-ADM)
Dyslipidemia	National Institute for Standards for Pharmacist Credentialing (NISPC)*	Certified Disease Manager (CDM)
Geriatrics	Commission for Certification in Geriatric Pharmacy (CCGP)	Certified Geriatric Pharmacist (CGP)
Life Support	American Heart Association	Advanced Cardiovascular Life Support Certification (ACLS)
	American Heart Association	Pediatric Cardiovascular Life Support Certification (PALS)
Lipids	National Institute for Standards for Pharmacist Credentialing (NISPC)*	Certified Disease Manager (CDM)
	Accreditation Council for Clinical Lipidology	Clinical Lipid Specialist
Nuclear	Board of Pharmaceutical Specialties (BPS)	Board Certified Nuclear Pharmacist (BCNP)
Nutrition Support	Board of Pharmaceutical Specialties (BPS)	Board Certified Nutrition Support Pharmacist (BCNSP)
Oncology	Board of Pharmaceutical Specialties (BPS)	Board Certified Oncology Pharmacist (BCOP)
Pain Management	American Academy of Pain Management (AAPM)	Credentialed Pain Practitioner (CPP)
Pharmacotherapy	Board of Pharmaceutical Specialties (BPS)	Board Certified Pharmacotherapy Specialist (BCPS)
Pharmacotherapy with Additional Qualifications in Cardiology	Board of Pharmaceutical Specialties (BPS)	Board Certified Pharmacotherapy Specialist (BCPS)
Pharmacotherapy with Additional Qualifications in Infectious Diseases	Board of Pharmaceutical Specialties (BPS)	Board Certified Pharmacotherapy Specialist (BCPS)
Poison Information	American Association of Poison Control Centers	Certified Specialist in Poison Information (CSPI)
Psychiatry	Board of Pharmaceutical Specialties (BPS)	Board Certified Psychiatric Pharmacist (BCPP)
Toxicology	American Board of Applied Toxicology	Diplomat of the American Board of Applied Toxicology (DABAT)

* The NISPC Certified Disease Manager Certification program expired on December 31, 2008

large pharmacy chains, and Internet pharmacy providers to reduce costs associated with the supply of medications and provide the convenience of home delivery of medications. Patients typically order their medications via telephone, fax, e-mail, or the Internet. Once a prescription order is transmitted to the mail-service pharmacy, patients usually receive their prescription within a week to ten days. Large numbers of pharmacists and pharmacy technicians are

employed at mail-service pharmacies, but many of the processes use high-volume automated dispensing technologies. Some mail-service pharmacies provide medication management services for individual or population-based patients.

Focused practitioners

"Focused practitioners" are those pharmacists who either see a wide variety of diseases in a specific setting or patient population such as pediatrics, or who treat a relatively narrow spectrum of diseases such as thrombotic disease. Pharmacists practicing as "focused practitioners" (Figure 2, Quadrant B) have the knowledge, skills, attitudes, and values—achieved through appropriate post-graduate education, training, and/or experience—to provide the level of care needed for patients in these settings. Specific competencies are usually needed to address these patients' unique medical and pharmacotherapy-related issues along with their associated socio-behavioral and cultural issues.

Pediatric pharmacy practice

The pediatric patient population spans the years from birth through adolescence, presenting a unique challenge with regard to drug therapy administration and monitoring. Unlike adults, dosing is most commonly based on body weight, and pharmacokinetic variables are standardized relative to weight and/or body surface area. Since physical growth and organ system maturation are dynamic processes throughout the aging continuum, frequent individual dosing calculations and adjustments are necessary, particularly in infants. Pediatric disease states, such as cystic fibrosis can further impact pharmacotherapy due to differences in pharmacokinetics seen in this particular subset of patients. Pediatric patients are under-represented in clinical trials, resulting in an inadequate evidence base on which to make individualized therapeutic decisions. Most commercially-available drugs are not formulated for use in infants and children. In addition, the pediatric patient population poses a higher risk for medication errors. Pediatric patients are three times more likely to suffer from a medication error; and a relatively small magnitude of error, as compared to adults, may result in more serious consequences, especially in the youngest, most vulnerable patients.[44] Pediatric patients frequently experience adverse drug reactions similar to adults, but adverse reactions in the pediatric population may be harder to recognize or be of greater or lesser intensity.[45] Adverse drug events occurred in 11 percent of admissions to 12 children's hospitals.[46] Pediatric pharmacists have specialized knowledge of the age-related differences that impact on medication regimens, are able to recognize the need of the individual patient, and then make the needed adjustments to ensure safe and effective medication use in infants, children and adolescents. Pediatric pharmacists possess a broad knowledge of treatment of the various diseases that are common in childhood, such as otitis media, as well as those diseases that are relatively rare, but more serious, such as cystic fibrosis. These pharmacists, who have often completed one or more years of post-graduate residency training, have been shown to be effective in decreasing preventable adverse drug events.[47,48]

Geriatric pharmacy practice

Elderly patients are unique in that they possess an altered metabolic capacity for medications due to, for example, increased body fat and water, decreased muscle mass, decreased cardiac output and perfusion, decreased protein binding, reduced liver function, and reduced physiologic reserve—all of which lead to unique medication selection and dosing requirements compared to younger adults.[49] As a result of concomitant disease states, multiple medications are often prescribed for elderly patients by a variety of providers. They also often require additional assistance to understand how to take their medications to avoid possible adverse drug effects. Lack of mobility, vision/hearing difficulties, and possible altered mental status may further hamper proper use of medications by the elderly. There is a shortage of healthcare professionals trained in geriatric pharmacotherapy and seniors older than 75 years of age are under-represented in clinical trials, resulting in a poor evidence base on which to make individualized therapeutic decisions.[50] As the number of elderly patients continues to increase, the contribution of the pharmacist to quality, long-term medication management will require dramatic expansion. Some state boards of pharmacy (eg, Florida) instituted a requirement for pharmacists to complete special certificate programs in the area of geriatrics/long-term care consulting. Since the area of geriatric pharmacotherapy is highly specialized, in 1997 the American Society of Consultant Pharmacists (ASCP) founded the Commission for Certification in Geriatric Pharmacy (CCGP), which now awards the Certified Geriatric Pharmacist (CGP) credential. (Table 6 and Appendix E Figure 7) The content outline for the certification examination is published on the CCGP Website http://www.ccgp.org/pharmacist/certification/content.htm.

As the proportion of elderly patients in society has increased, so has the demand for long-term care. The term long-term care (LTC) encompasses pharmacy practice in skilled nursing facilities, intermediate-care facilities, assisted-living facilities, psychiatric centers, rehabilitation centers, and sub-acute care settings. Pharmacists practice in these areas as consultants, preparers, dispensers, and/or in-house reviewers of patients' medication regimens. Consultant pharmacists play a crucial role in LTC settings as a result of federal mandates in 1974 requiring pharmacist-conducted drug regimen reviews at least monthly for all residents of skilled nursing facilities.[51] This requirement was extended to intermediate care facilities in 1987. Beginning with statutory requirements in 1990, pharmacists have an expanded essential role in ensuring the proper use of psychoactive medications and ensuring resident's drug regimens are optimized (ie, eliminating excessive dose and duration, duplicate therapy, inadequate monitoring, unsubstantiated indications for use, and continued use in the presence of adverse consequences indicating the dose

should be reduced or discontinued). In 1999, the "Beers Criteria" was added to the drug therapy guidelines for nursing facility residents to ensure avoidance of certain medications that are inappropriate or potentially inappropriate for use in seniors.[52,53] Pharmacists have also expanded the provision of clinical services to patients in Adult Congregate Living Facilities.

Certified diabetes educators

Diabetes is costly to manage and its prevalence has been increasing at an epidemic rate. Managing diabetic patients presents an enormous challenge (clinical and economic) to healthcare providers and the healthcare system. The CDC has reported that the availability of preventive care is insufficient to meet the need, and compliance with national health recommendations is suboptimal.[54] Patient education and behavioral interventions play an important role in improving the management of diabetic patients. Pharmacists focusing their practice on diabetic patients commonly complete certificate training programs on diabetes and can continue building their credentials in this area. Pharmacists who have been certified as diabetes educators (CDEs) focus much of their practice on the provision of education and other professional services to diabetic patients to improve blood glucose control, thereby preventing diabetes-related complications and positively impacting patient outcomes. This process involves assessment of the patient's education needs, identification of self-management goals, education and behavioral interventions, and evaluation of achievement of goals. In addition to educational activities, professional services provided by pharmacists in the management of diabetic patients include dispensing, drug and device information (to patient, caregiver and other healthcare professionals), modification of therapy and ordering of laboratory tests under protocol, nutritional and physical assessments, point-of-care testing, and referrals to other specialty providers. Pharmacist CDEs typically practice in ambulatory care clinics and community pharmacies, but may also be found in hospitals. Apart from improved clinical outcomes for patients, pharmacist-based diabetes programs have demonstrated significant cost savings. Some pharmacist CDEs have also achieved the Board Certified Advanced Diabetes Management (BC–ADM) credential—an advanced multidisciplinary certification in diabetes care that emphasizes clinical assessment and disease-state management.

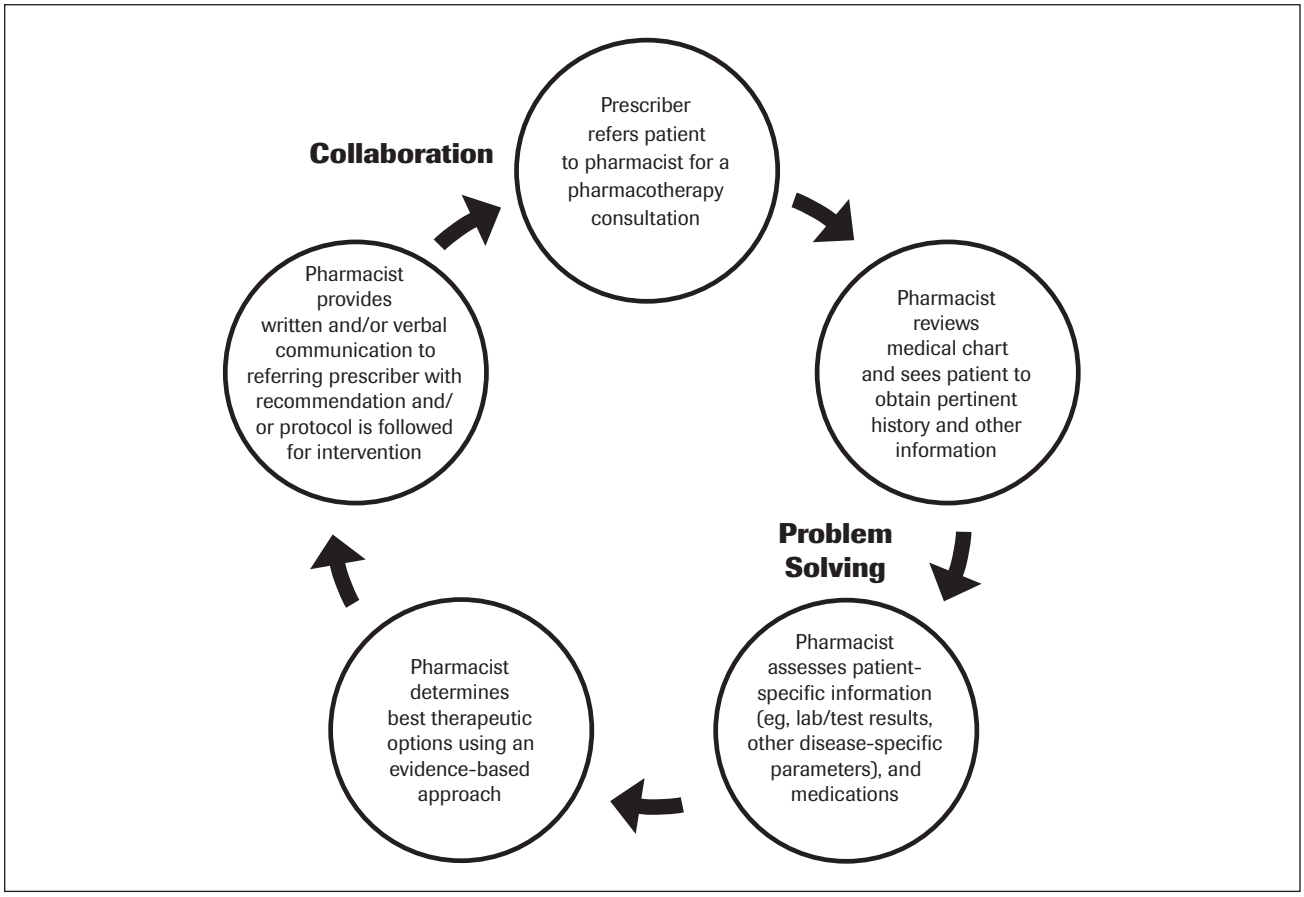

Figure 5. Flow diagram of prescriber–pharmacotherapy specialist interactions intended to optimize medication therapy

Compounding pharmacists

Because every patient has different needs, customized, compounded medications are a vital part of quality medical care. The basis of the profession of pharmacy has always been the patient–physician–pharmacist relationship. Through this relationship, patient needs are determined by a physician, who chooses a treatment regimen that may include a compounded medication. Physicians prescribe compounded medications for many reasons including the following situations:

- When needed medications are discontinued by or generally unavailable from pharmaceutical companies, often because the medications are no longer profitable to manufacture,
- When the patient is allergic to certain preservatives, dyes, or binders in off-the-shelf medications,
- When treatment requires tailored dosage strengths for patients with unique needs (eg, infants),
- When a pharmacist can combine several medications the patient is taking to increase compliance,
- When the patient cannot ingest the medication in its commercially available form and a pharmacist can prepare the medication in cream, liquid, or other, more easily used form,
- When medications require flavor additives to make them more palatable for some patients, most often children.

For those people with unique health needs that cannot be met by commercially available manufactured prescription medicines, compounded medications prescribed or ordered by physicians can be prepared safely by trained compounding pharmacists. Compounding is in even greater demand for treating animals because of their greater diversity in size and therapeutic needs and the relatively narrow selection, flavors, and dosages of medicines that are manufactured by pharmaceutical companies.

Many pharmacists have unique knowledge and skills in pharmaceutical compounding, having studied chemical compatibilities and been trained to prepare alternate dosage forms. Accreditation standards for professional degree programs in pharmacy require instruction in compounding pharmaceutical ingredients and so all pharmacists have foundational knowledge and skills in this area. Some pharmacists, however, have elected to focus their practice in this area and have additional experience, education, and training.

In 2004, the Pharmacy Compounding Accreditation Board (PCAB) was established by eight national pharmacy organizations. This was an important development impacting the practice of pharmacy compounding because it established a national standard of best practices for compounding pharmacies. PCAB accreditation is a voluntary process focused on maximizing the quality of pharmacy compounding and reducing risk of patient harm. PCAB accreditation has been recognized by the American Medical Association and the American Pharmacists Association as a way to identify compounding pharmacies that meet high quality standards.[55,56]

Advanced generalist practitioners

Pharmacists practicing as "advanced generalist practitioners" (Figure 2, Quadrant C) provide services to a wide variety of patients with complex healthcare issues covering a broad range of diseases. Many such pharmacists are board certified in a defined specialty such as pharmacotherapy. Their advanced knowledge, skills, and experience are developed in a broad, varied population. An advanced generalist practitioner must be competent in assessing the status of complex patients, developing individualized therapeutic regimens to achieve the desired outcomes, and implement and monitor the patient's response to optimize their therapeutic outcome. Such pharmacists may work in a variety of settings, including direct patient care settings (community pharmacies, clinics, and hospitals) where the pharmacist usually interacts face-to-face with the patient, or in an alternative care delivery setting such as a call center of a managed care organization or health plan for patients with complex healthcare needs requiring MTM services such as anticoagulation. For these pharmacists, collaboration with other healthcare professionals is an integral part of their practice—not only for the management of individual patients but for the collaborative development of treatment protocols for management of groups of patients, based on best practice and evidence.

Pharmacotherapy specialists

Figure 5 summarizes the functioning of an "advanced generalist practitioner" working as a pharmacotherapy specialist. Pharmacotherapy, as defined by BPS, is that area of pharmacy practice that is responsible for ensuring the safe, appropriate, and economical use of drugs in patient care. The pharmacotherapy specialist (BCPS) has responsibility for direct patient care, often functions as a member of a multidisciplinary team, and is frequently the primary source of drug information for other healthcare professionals.

Advanced focused practitioners

Pharmacists practicing as "advanced focused practitioners" (Figure 2, Quadrant D) have sophisticated knowledge, skills, and experience to draw from when dealing with a narrow and focused patient population or practice site. Within each area the specific professional responsibilities of the pharmacist may be different. A pharmacist specializing in drug therapy for cardiovascular disease might be responsible for both patient education and adherence while also individualizing medication regimens and maintaining a specialized practice such as an anticoagulation clinic. By contrast, an HIV/AIDS specialist has an extensive knowledge base regarding antiretroviral medications and infectious disease as they pertain to the treatment of an HIV/AIDS patient, but less advanced knowledge in the treatment of sepsis in a trauma patient. In addition to serving medically complex patients, advanced focused practitioners often manage complex therapies, diagnostic agents, and technologies. Because of the advanced knowledge, skills, and experience, and narrow focus of an advanced focused practitioner, they are considered experts

Table 7. Pharmacist roles in managed health care organizations

Role	Description of Activity
Drug Distribution and Dispensing	*Through their own pharmacies:* pharmacists provide enhanced pharmaceutical services, beyond traditional dispensing, because they are members of a fully integrated patient care system *Through community pharmacies:* broad-based networks of contracting pharmacies interface with managed care pharmacists to provide online eligibility and claims processing *Through mail order:* pharmacists assess legitimacy of prescriptions, eligibility for coverage, appropriateness and safety of the medication for the patient
Patient Safety	*Drug Utilization Review (DUR)* is a process that identifies potential prescription-related problems such as drug-drug interactions, duplication of drugs, known allergies, under or overdosing or inappropriate therapy Prior Authorization (PA) is an approval process that encourages proper use of medications and discourages inappropriate prescribing Monitoring Programs for certain drugs that require lab-based monitoring for dosage adjustment Quality Assurance (QA) programs that enhance patient safety and improve patient drug use
Clinical Program Development	Use evidence-based clinical and research data to create disease management programs Evaluate scientific evidence in order to select appropriate drugs for a patient population through a Pharmacy and Therapeutics (P&T) Committee Design and conduct outcomes based research in order to help patients achieve the desired results from their drug therapy
Communication with Patients, Prescribers and Pharmacists	Helps prescribers choose drugs that will meet patients' needs and qualify for coverage Provide and educate patients about their individual prescription history Provide a dispensing pharmacist with a patient's drug profile in order to identify potential adverse drug reactions or duplicate therapies
Drug Benefit Design	Determining if a formulary (approved list of medications that the plan will cover) should be used, and whether it should be "restricted" or "open"; and the use of patient cost-sharing structure for generic, covered brand-name drugs and non-formulary drugs Determine if a "participating" pharmacy network should be established and what the criteria for QA would be Determine criteria and procedures for drug utilization
Business Management	Negotiate with manufacturers for discounts on drug prices for clients in exchange for moving market share Provide clients with customized clinical reporting that meet their population needs
Cost Management	Encourage prescribers to make cost effective drug choices Identify compliance and noncompliance with prescribing guidelines; assess physician performance; identify prescribing patterns that require improvement

in their specialized fields. Many board-certified specialists would, therefore, be "placed" in this practice quadrant, including pharmacotherapy specialists with the two "added qualifications" currently recognized by BPS—Cardiology and Infectious Diseases. Many of these individuals may also have completed a postgraduate year two (PGY2) pharmacy residency in a focused area of training. The practice of pharmacists in the four more "focused" BPS specialty areas is summarized below. Additional detail can be found on the BPS Website www.bpsweb.org or in Appendix D of CCP's resource document *Credentialing in Pharmacy*.

Nuclear pharmacy was the first recognized area of specialty practice within pharmacy. Nuclear pharmacists seek to improve and promote the public health through the safe and effective use of radioactive drugs for diagnosis and therapy. A nuclear pharmacist, as a member of the nuclear medicine team, specializes in the procurement, compounding, quality-control testing, dispensing, distribution, and monitoring of radiopharmaceuticals. In addition, the nuclear pharmacist provides consultation regarding health and safety issues, as well as the use of nonradioactive drugs and patient care. Working with radioactive isotopes as part of a compounding process demands specialized training, with requirements set in part by the Nuclear Regulatory Commission.[57] This product-focused training has tended to link this area of practice with the compounded product rather than a clinical service. Nuclear pharmacy practice largely occurs in two areas—within free standing radiopharmacies or within hospital settings. Nuclear pharmacy and nuclear medicine practice are interprofessional areas of practice involving technologists

(who acquire the images), occasionally chemists, physicists, nurses, pharmacists, and physicians.

Nutrition support pharmacy addresses the care of patients who receive specialized nutrition support, including parenteral and enteral nutrition. Nutrition support pharmacists have responsibility for promoting maintenance and/or restoration of optimal nutritional status and designing and modifying treatment according to the needs of the individual patient. Nutrition support pharmacists have responsibility for direct patient care and often function as members of an interprofessional nutrition support team.

Oncology pharmacists provide specialized care to patients with cancer. Specialists recommend, design, implement, monitor and modify pharmacotherapeutic plans to optimize outcomes in patients with malignant diseases. This includes the supportive care needed to minimize side effects from the oncology treatments and the disease. Oncology agents require specialized handling and preparation, and the patients require frequent monitoring to achieve the desired outcome. Pharmacists play a key role in assuring the safety and optimum care of these patients. Oncology pharmacists may practice in hospitals or ambulatory oncology clinics, or a combination of both. Many oncology agents are now infused in ambulatory infusion centers.

Psychiatric pharmacy addresses the care of patients with psychiatric-related illnesses. As a member of an interprofessional treatment team, the psychiatric pharmacy specialist is often responsible for optimizing drug treatment and patient care by conducting such activities as monitoring patient response, patient assessment, recognizing drug-induced problems, and recommending appropriate treatment plans.

Pharmacy practice in "nontraditional" healthcare settings

A growing number of pharmacists are practicing in what could be referred to as "nontraditional" practice roles or settings. Pharmacists in such roles contribute directly to patient care (at the individual patient and population levels) and may have direct interactions with patients and healthcare professionals, but not necessarily face-to-face. Pharmacists are also involved in providing care to animals. Veterinary pharmacists receive special training in veterinary pharmacology and therapeutics and must be proficient at compounding, which is a key service for animal patients. The complete spectrum of nontraditional pharmacist roles cannot be provided in this paper, but a few examples are given below:

Managed care organizations

A pharmacist in a managed care practice provides a markedly different type of professional activity, and as a result, additional competencies are required. For a pharmacist working in this environment, patients are monitored as a population database and pharmacist care is directed through database review and querying. Economic and clinical outcomes are weighed against, and with each other, to make appropriate decisions for a "population" of patients. Pharmacists practicing in managed care organizations, including health plans and PBMs, are responsible for a broad range of clinical, quality-oriented drug management services.[58] The role of a pharmacist in a managed care organization is often stratified into seven different areas of activity: (1) drug distribution and dispensing; (2) patient safety; (3) clinical program development; (4) communication with patients, prescribers and pharmacists; (5) drug benefit design; (6) business management; and (7) cost management. Additional detail is provided in Table 7.

Drug distribution within a managed care model has embraced many pharmacy roles. Service providers in this type of setting are encouraged to collaborate in the provision of health care through an interprofessional approach. Patient management is based on provider group interactions that address all aspects of individualized patient care. This interprofessional team includes but is not limited to the physician, nurse, physician's assistant, nurse practitioner, pharmacist, nutritionist, medical assistant, and benefits manager. A pharmacist in this environment has the benefit of direct and immediate contact with not only the primary healthcare provider, but also the rest of the healthcare team. This kind of one-on-one contact among health professionals often leads to more patient-centered health care and efficient MTM services. Also, within this type of environment, the pharmacist has access to pharmacy claims data, which allows for large numbers of patients to be reviewed. Since many of these models have an integrated dispensing pharmacy program, the patient-care team can monitor medication adherence and utilization.

Patient care call eenters

Call center pharmacists provide patient and prescriber education, patient counseling, drug information, and customer service, as well as drug utilization review, health management and formulary management. Pharmacists in call centers interact with patients telephonically to promote effective drug therapy. Call center pharmacists are primarily employed in health maintenance organizations (HMOs), PBMs, and health plans, but may also be found in other environments. These pharmacists make calls to and receive calls from patients to optimize medication therapy. Some calls focus on medication adherence reminders; others are to obtain information about adverse medication events; and some calls focus on patients' questions about treatment. Some call center pharmacists focus on specific disease states, such as anticoagulation, hypertension, or diabetes. In the disease-specific model, pharmacists manage the medication therapy for one disease. Another model places a patient's total medication therapy under the direction of one call center pharmacist. In this model, pharmacists manage full patients' drug regimens and are able to suggest changes and make referrals to other healthcare professionals to ensure positive patient outcomes. Call centers may provide services for specific member populations, for example, MTM services for Medicare Part D beneficiaries.

Table 8. Model curriculum for pharmacy technician training: Goal statements

Goal 1:	Assist the pharmacist in collecting, organizing, and evaluating information for direct patient care, medication	Goal 19:	Resolve conflicts through negotiation.
Goal 2:	Receive and screen prescription/medication orders for completeness and authenticity	Goal 20:	Understand the principles for managing change.
Goal 3:	Prepare medications for distribution.	Goal 21:	Appreciate the need to adapt direct patient care to meet the needs of diversity.
Goal 4:	Verify the measurements, preparation, and/or packaging of medications produced by other technicians	Goal 22:	Appreciate the benefits of active involvement in local, state, and national technician and other pharmacy organizations.
Goal 5:	Distribute medications.	Goal 23:	Appreciate the value of obtaining technician certification.
Goal 6:	Assist the pharmacist in the administration of immunizations.	Goal 24:	Understand the importance of and resources for staying current with changes in pharmacy practice.
Goal 7:	Assist the pharmacist in the identification of patients who desire/require counseling to optimize the use of medications, equipment, and devices.	Goal 25:	Communicate clearly when speaking or writing.
Goal 8:	Initiate, verify, assist in the adjudication of, and collect payment and/or initiate billing for pharmacy services and goods.	Goal 26:	Maximize work efficiency through the use of technology.
Goal 9:	Purchase pharmaceuticals, devices, and supplies according to an established purchasing program.	Goal 27:	Efficiently solve problems commonly encountered in one's own work.
Goal 10:	Control the inventory of medications, equipment, and devices according to an established plan.	Goal 28:	Display a caring attitude toward patients in all aspects of job responsibilities.
Goal 11:	Assist the pharmacist in monitoring the practice site and/or service area for compliance with federal, state, and local laws; regulations; and professional standards.	Goal 29:	Maintain confidentiality of patient and proprietary business information.
Goal 12:	Maintain pharmacy equipment and facilities.	Goal 30:	Understand direct patient care delivery systems in multiple practice settings.
Goal 13:	Assist the pharmacist in preparing, storing, and distributing investigational medication products.	Goal 31:	Efficiently manage one's work whether performed alone or as part of a team.
Goal 14:	Assist the pharmacist in the monitoring of medication therapy.	Goal 32:	Function effectively as a member of the health care team.
Goal 15:	Participate in the pharmacy department's process for preventing medication misadventures.	Goal 33:	Balance obligations to one's self, relationships, and work in a way that minimizes stress.
Goal 16:	Take personal responsibility for assisting the pharmacist in improving direct patient care.	Goal 34:	Understand the use and side effects of prescription and nonprescription medications used to treat common disease states.
Goal 17:	Demonstrate ethical conduct in all job-related activities.	Goal 35:	Assist the pharmacist in assuring the quality of all pharmaceutical services.
Goal 18:	Maintain an image appropriate for the profession of pharmacy.		

Hospice

Hospices range from small rural organizations to very large hospices. Regardless of the organization's structure, a large part of the care they provide, and a significant cost, is medication-centered. Pharmacists practicing in this setting help to ensure that medications are appropriately selected and that management of symptoms is balanced with cost–effectiveness. ASHP has published a statement on the Pharmacist's Role in Hospice and Palliative Care, which outlines service issues that should be addressed, including: (i) assessing the appropriateness of medication orders and ensuring the timely provision of effective medications for

symptom control; (ii) counseling and educating the hospice team about medication therapy; (iii) ensuring that patients and caregivers understand and follow the directions provided with medications; (iv) providing efficient mechanisms for extemporaneous compounding of nonstandard dosage forms; (v) addressing financial concerns; (vi) ensuring safe and legal disposal of all medications after death; and (vii) establishing and maintaining effective communication with regulatory and licensing agencies.[59] Hospice programs are varied in their structure and hospice pharmacy practice models have evolved to complement these programs. Models include: (a) hospice-employed pharmacist; (b) contracted consultant pharmacist or pharmacist group; (c) pharmacy benefits manager (PBM) with or without in-house or contracted clinical pharmacist services; (d) central dispensing pharmacy with PBM and clinical support that services hospices regionally or nationally; (e) selected pharmacies that generally dispense on a contract basis to a local hospice; and (f) community pharmacies that dispense to hospice patients usually on contract with the hospice. Compounded medications often constitute a significant element of the pharmacy services provided because of the need to individualize dosages and/or dosage forms for terminally ill patients.

Drug and poison information services

Drug and poison information services have had a longstanding role in the emergence of clinical roles for pharmacists that were built on "drug expert" contributions. Pharmacy drug information services have expanded in recent years to include many practice areas from the hospital drug information service to community practice-based pharmacies. Easier access to information via the Internet, CD or DVD-based drug information databases, and electronic journals has contributed to this development. Pharmacists access these databases to assist medication prescribers, the healthcare community, and the general public (as appropriate) with information on drug indication and dosing, interactions such as drug–drug, drug–food, drug–disease, and drug–diagnostic test, adverse drug reactions, drug use for specialized populations (eg, elderly, pediatric, immunosuppressed, diabetic), parenteral nutrition calculations, chemotherapeutic dosing regimens, toxicology and poisoning, and evidence-based medical literature review. While the work of these pharmacists is typically not delivered directly to the patient, its impact on patient care is significant. On meeting the certification requirements, pharmacists working in centers certified by the American Association of Poison Control Centers can become Certified Specialists in Poison Information (CSPI).

Pharmacist information technology specialist

The rapid development of technology and the impact technology can have on patient care have led to the emergence of the pharmacist information technology specialist or pharmacy "informatics" specialist. These individuals are in high demand especially in large health systems. Initiatives such as CPOE, bar coding, dispensing software development, automated medication dispensing machines, programmed infusion devices, and systems maintenance require both a clinical and technical knowledge to be implemented effectively and to reduce errors.

Pharmacists in academia, health organization management, regulatory oversight, pharmacy organizations, and industry

Many pharmacists pursue a career that allows them to help facilitate the attainment of the goals of the profession through academic, organizational, and government initiatives that are focused on advancing the full scope of pharmacy practice.

Pharmacists who choose to combine practice with academia have a responsibility to develop practice, research, and teaching role models in evolving healthcare settings. These innovative areas of practice become integrated into the experiential component of the pharmacy curriculum, thus contributing to sustained practice advancement.[60] As university faculty members, pharmacists have multiple paths from which to choose. Faculty positions vary greatly but, in general, they include an integration of practice activities with clinical programs, research, teaching, mentoring, consulting, scholarship, community and campus-based service, and collaboration with other health science programs. Others may focus primarily on research, establishing novel research programs that bridge practice with basic and/or clinical science. Preparation for academic positions may include additional work through postgraduate education or training programs, either academic degree programs (eg, Masters or PhD) or professional programs (ie, residencies, fellowships) and/or specialty certification depending on the faculty role expectation. Regardless of practice site—from generalist to the most specialized practices—pharmacists have the opportunity to serve as preceptors for colleges and schools of pharmacy to help prepare future pharmacists.

Professional pharmacy organization management is another area that pharmacists utilize their expertise to organize and administer initiatives that have a regional, national, or even international impact on pharmacy practice. Leaders in professional pharmacy organizations assist the profession as a whole by representing pharmacists with regard to education, practice, credentialing, reimbursement, health policy, and future planning for practitioners and graduating students.

Pharmacists also hold positions within government agencies and nongovernmental organizations, such as the US Public Health Service (PHS) Commissioned Service (Food and Drug Administration (FDA) Indian Health Service (IHS) and Bureau of Prisons), the National Institutes of Health (NIH), the CDC, the Armed Services, state boards of pharmacy, and the World Health Organization (WHO) or Pan American Health Organization (PAHO). They serve in a multitude of capacities relying on their pharmacy degree as a foundation for the particular area in which they are working.

The pharmaceutical industry has become an environment that offers many types of positions for pharmacists. Opportunities in industry include drug development research, post-approval drug marketing, pharmaceutical sales, drug information, quality control, administration, consulting, and advisory roles. Curricular changes addressing advances in clinical pharmacotherapeutics and pharmacoeconomics have allowed for expanded job opportunities for PharmD graduates in this sector. As a result, positions are available to new graduates and those with professional practice experience.

Pharmacy technicians

A pharmacy technician is an individual working in a pharmacy who, under the supervision of the licensed pharmacist, assists in pharmacy activities that do not require the professional judgment of a pharmacist. A certified pharmacy technician (CPhT) is a pharmacy technician who has passed a certification examination and is maintaining his/her certification. A 2002 white paper on pharmacy technicians provided a comprehensive analysis of historical developments, drivers for change, work-force issues, and the education, training, certification, and regulation of pharmacy technicians.[61] The paper called for a profession-wide vision for pharmacy technicians, identified the key issues that needed to be addressed, and described the needed action.

An increasing number of state boards of pharmacy, recognizing the integral role of pharmacy technicians, have revised practice regulations to allow a broadening of their responsibilities and regulation of pharmacy technicians has increased significantly over the past 15 years. In 1993, only 12 states regulated pharmacy technicians. At present, 39 states regulate pharmacy technicians through licensure, certification, or registration. It is estimated that there are over 280,000 technicians regulated by state boards of pharmacy. The majority of states require some level of training or education that must be completed by a pharmacy technician; 29 of the 39 states that regulate pharmacy technicians have mandated training requirements. The majority of these training programs must be reviewed, or approved by the state board of pharmacy. As a part of their regulation of technicians, 14 boards of pharmacy have examination requirements that must be completed, such as the Pharmacy Technician Certification Examination (PTCE) (see below). An overview of the state regulation of pharmacy technicians is provided in NABP's annual Survey of Pharmacy Law.[62] The following synopsis of the practice and credentialing of pharmacy technicians is provided to give readers an understanding of the vital role that they play in the delivery of pharmacy services.

Pharmacy technicians work in a wide variety of practice settings, including community pharmacies, hospitals,

Table 9. Examination blueprints for certification of pharmacy technicians

Pharmacy Technician Certification Examination (PTCE)

Functions	% of exam	Activities
Assisting the Pharmacist in Serving Patients	66%	Receive prescription/medication order(s)
		Collect and communicate patient-specific data
		Assess prescription or medication order for completeness, accuracy, authenticity, legality, and reimbursement eligibility
		Process a prescription/medication order
		Compound a prescription/medication order
		Provide prescription/medication to patient/patient's representative
		Direct patient/patient's representative to pharmacist for counseling
Maintaining Medication and Inventory Control Systems	22%	Identify pharmaceuticals, durable and non-durable medical equipment, devices, and supplies (including hazardous substances and investigational products) to be ordered
		Remove from inventory expired/discontinued/slow moving/overstocked pharmaceuticals, durable and nondurable medical equipment, devices, and supplies
		Perform required inventories and maintain associated records
Participating in the Administration and Management of Pharmacy Practice Administration and Management of Pharmacy Practice	12%	Coordinate written, electronic, and oral communications throughout the practice setting
		Update and maintain patient information
		Use and maintain automated and point-of-care dispensing technology
		Communicate with third-party payers to determine or verify coverage for products and services

Table 9 *continued*

Exam for Pharmacy Technician Certification (ExCPT)

Functions	% of exam	Activities
Regulations and Technician Duties	25%	Role of pharmacists and pharmacy technicians, technician functions, prescription department layout and workflow, pharmacy security, inventory control, identifying expired products
		Controlled substances: schedules and regulations, refills, filing, prescription transfers, Schedule V sales
		Federal privacy act, generic substitution, professionals with prescribing authority, child-resistant packaging, role of government agencies, manufacturer drug package labeling, OTC package labeling
Drugs and Drug Therapy	23%	Major drug classes, dosage forms, over-the-counter products, NDC number
		Brand and generic names, basic mechanism of action and drug classification, primary indications, common adverse drug reactions, interactions, and contraindications
Dispensing Process	52%	Information required on a valid prescription form, telephoned and faxed prescriptions, refill requirements, patient information, interpreting prescribers' directions for prescription labels
		Avoiding errors, checking prescriptions, automated dispensing systems, preparing prescriptions and data entry, labeling prescriptions, patient records, packaging and storage, managed care prescriptions
		Conversions, systems of measurement, calculations for dispensing and compounding, calculating dosages and administration rates for IVs, business calculations
		Drug distribution in hospitals and nursing homes, repackaging medications, prescription compliance aids, aseptic technique, procedures for chemotherapy, routes of administration for parenteral products, sterile products, maintaining a sterile product environment, compounding and labeling of sterile product prescriptions

the military, home health care, long-term care, prescription mail-order facilities, managed healthcare facilities, and educational/training programs. The role of a pharmacy technician has evolved to assist the pharmacist in a variety of practice settings with completing the technical aspects of dispensing prescriptions such as computer entry, labeling, medication preparation, record keeping, insurance form completion, and maintenance of an appropriate supply of medications in the pharmacy. The pharmacy technician is accountable to the supervising pharmacist who, in turn, is legally responsible—through state licensure—for the care and safety of patients served by the pharmacy. Pharmacy technicians are a critical part of the pharmacy work force, and the ever-increasing complexity of practice requires the increased utilization of qualified competent technical personnel.

Tasks and functions of pharmacy technicians

In its Model Act, NABP defines pharmacy technicians as "personnel registered with the Board who may, under the supervision of the pharmacist, assist in the pharmacy and perform such functions as assisting in the dispensing process; processing of medical coverage claims; stocking of medications; cashiering but excluding drug regimen review; clinical conflict resolution; prescriber contact concerning prescription drug order clarification or therapy modification; patient counseling; dispensing process validation; prescription transfer; and receipt of new prescription drug orders."[63] There have been recurring collaborative initiatives to analyze and document the work activities of pharmacy technicians. Some of these studies have been accomplished at the same time as an evaluation of professional activities of pharmacists, eg, the Scope of Pharmacy Practice Project (1992–1994) mentioned above.[32, 64] The most recent practice analysis for pharmacy technicians was completed in 2005. It identified new responsibilities performed by CPhTs, including the handling and processing of restricted, investigational, and chemotherapy drugs; working in mail-order pharmacy settings; and increased involvement in third-party payment. New knowledge areas identified in the practice analysis included knowledge of error prevention strategies for data entry, cultural diversity, third-party payment, and

pharmacy benefit management companies. The practice analysis indicated that CPhTs spend about 66 percent of their time assisting the pharmacist in serving patients, 22 percent maintaining medication and inventory control systems, and 12 percent participating in pharmacy practice management and administration. This distribution of the workday is similar across community, health-system, and other work settings. Community-based CPhTs are most frequently involved in assisting with outpatient prescription dispensing, purchasing and inventory control, and billing. For health-system CPhTs, assisting in inpatient medication dispensing, preparing intravenous admixtures, and prepackaging and repackaging are the primary responsibilities.

CPhTs are taking on additional, more advanced responsibilities, including those more traditionally performed by a pharmacist. In community settings, there has been growth in the extent to which pharmacy technicians are contacting prescribers for clarification of prescriptions and participating in quality assurance activities. Skilled technicians are now playing an important role in improving patient safety and medication-error strategies. Technician roles include medication order entry, multiple-point checking, screening medication orders for dangerous medical abbreviations, physically separating look-alike medications and sound-alike medication names, and assisting the pharmacist in monitoring patient outcomes by collecting patient-specific data. Many CPhTs now have expanded supervisory responsibilities, including order-entry verification, preparation and packaging of medications produced by other technicians, and preparing prescription and medication orders for final approval by a pharmacist, as allowed by law. Additional practice management tasks include collecting productivity information, performing billing and accounting functions, performing or contributing to employee evaluations, and participating in the establishment, implementation, and monitoring of policies and procedures.

There have been a number of significant positive developments affecting pharmacy technicians in the past ten to fifteen years including the establishment of certification boards, the development of the Model Curriculum for pharmacy technician training[65], an expansion in the number of accredited training programs, and greater regulatory recognition of pharmacy technicians in state pharmacy practice acts. Pharmacy technician education and training requirements vary among states and employers; there is, however, a trend toward more formalized technician training, either through an academic training program or on the job. The Model Curriculum provides a starting point for identifying core competencies for pharmacy technicians and a framework for training pharmacy technicians for all practice settings and geographic locations. The goal statements of the Model Curriculum are listed in Table 8. Several national pharmacy organizations have adopted policies calling for nationally standardized education and training for pharmacy technicians.[66–68] The development of guidelines and standards to regulate the qualifications of individuals who work as pharmacy technicians will ultimately reduce the variation in pharmacy technician qualifications and deployment across the country.

Accreditation of pharmacy technician training programs

In an attempt to standardize pharmacy technician training programs, in 1982 ASHP established a process of programmatic accreditation for pharmacy technician training programs. The accreditation standards require all accredited programs to educate and train pharmacy technicians on core outcomes that relate to the knowledge required and activities most frequently performed by pharmacy technicians. These outcomes encompass activities that occur in both community and hospital settings. The program must include didactic and experiential training. ASHP utilizes the Pharmacy Technician Certification Board's scope of practice analysis data to determine the required outcomes for programs. Accredited programs include employer's own programs (eg, chain drug stores, military) and programs in hospitals, community colleges, vocational/technical colleges, and universities. All programs are held to the same accreditation standard. Some states require that pharmacy technicians complete an accredited training program to become registered or licensed. Not all institutions offering training programs for pharmacy technicians have programmatic accreditation, however, many have institutional accreditation. Only ASHP programmatic accreditation reviews the actual technician curriculum and experiential training component directly related to actually training a pharmacy technician.[61,69]

Certification of pharmacy technicians

Certification of pharmacy technicians commenced nationally in 1995 with voluntary certification by the Pharmacy Technician Certification Board (PTCB), which administers the PTCE. A second certifying body—the Institute for the Certification of Pharmacy Technicians (ICPT)—was established in October 2005; ICPT administers the Exam for Certification of Pharmacy Technicians (ExCPT). The validity and defensibility of the certification examinations are maintained by conducting periodic practice analyses and through external evaluation of the certification program; both certification programs are accredited by the National Commission for Certifying Agencies (NCCA)[f].[70,71] From 1995 to March 2008, PTCB has certified over 300,000 pharmacy technicians through examination or transfer process.[72] As at July 2008, ICPT has certified over 2,400 pharmacy technicians. PTCB completed its latest practice analysis in 2005 and developed the Content Outline for the PTCE based on the results.[73] ICPT completed a similar practice analysis in 2005. The certification examinations are designed to assess the candidate's knowledge and skill base for activities that are most commonly performed by a pharmacy technician, as determined by national task analyses. The PTCE Content Outline is divided into three domains: (1) assisting the pharmacist in serving patients; (2)

maintaining medication and inventory control systems; and (3) participating in the administration and management of pharmacy practice. The ExCPT Content Outline is similarly divided: (1) regulation and technician duties; (2) drugs and drug products; and (3) the dispensing process. Table 9 provides a summary of the examination blueprints that define the roles, responsibilities, functions, and competencies of a pharmacy technician upon successful completion of the certification exam.[74,75] Full details of the content outlines can be found on the respective Websites www.ptcb.org and www.nationaltechexam.org. CPhTs are required to complete approved continuing education activities to maintain their certification, and a growing number of states require continuing education for maintenance of licensure or registration. ([f]The NCCA is the accrediting body of the National Organization for Competency Assurance [NOCA].)

Summary

The evolutions in health care and pharmacy practice are presenting many new opportunities for pharmacists to perform functions and provide services not considered as traditional roles.[76] A clear vision for pharmacy practice has been articulated. New roles and responsibilities for pharmacy technicians will assist pharmacists to achieve this vision. As pharmacists evolve their practice to meet the healthcare needs of society related to medication use and pharmacotherapy, individual practitioners seek to expand the scope of services they offer to provide high quality, relevant care to patients.[76] Education, training, and licensing processes to underpin practice are competency-based. New professional services have been introduced and an expanded range of post-licensure credentials, education, and training have been created to assure the contemporary competence of all practitioners and to support their continuing professional development and career progression. Accreditation and psychometrically sound examinations have been developed to provide consistency and quality assurance in the education, training, and credentialing of both pharmacists and pharmacy technicians. The profession of pharmacy is working to achieve a pervasive model and standard of care determined only by the needs of patients and populations. The Council on Credentialing in Pharmacy hopes that the material presented herein, including the framework for credentialing in pharmacy practice, will allow audiences to gain a better understanding of where pharmacy is today and what future pharmacy practice will look like.

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Glossary

For the purpose of this paper, the following are the definitions, interpretations, and intent of the terms utilized throughout the paper:

Accreditation: The process whereby an association or agency grants public recognition to an organization, site, or program that meets certain established qualifications or standards, as determined through initial and periodic evaluations.

Adherence: A patient's correct following of professional advice or directions.

Ambulatory care: Health services delivered on an outpatient basis.

Blueprint [as in "examination blueprint"]: An indication of the proposed structure and definition of the exam; the content or topic areas that will be included on the exam; any required levels of cognitive demand or processing level for each topic area; the number of items that should be included by topic and cognitive level; and any relevant item specifications by topic and cognitive level.

Certificate Program: A structured, systematic, postgraduate education and continuing education experience for pharmacists that is generally smaller in magnitude and shorter in duration than a degree program or residency training program. Certificate programs are designed to instill, expand, or enhance practice competencies through the systematic acquisition of specific knowledge, skills, attitudes, and performance behaviors.

Certification: The voluntary process by which a nongovernmental agency or an association grants recognition to an individual who has met certain predetermined qualifications specified by that organization. This formal recognition is granted to designate to the public that this individual has attained the requisite level of knowledge, skill, and/or experience in a well-defined, often specialized, area of the total discipline. Certification usually requires initial assessment and periodic reassessments of the individual's knowledge, skills, and/or experience.

Certified: Adjective that is used to describe an individual who holds certification and that is incorporated into the name of the credential awarded that individual. For example, someone who has earned BPS certification in oncology is a "Board-Certified Oncology Pharmacist."

Clinical privileges: Authorization to provide a specific range of patient-care services. (See also Privileging)

Collaborative Drug Therapy Management: Collaborative drug therapy management (CDTM) is a team approach to healthcare delivery whereby a pharmacist and prescriber establish written guidelines or protocols authorizing the pharmacist to initiate, modify, or continue drug therapy for designated patients. (Alliance for Pharmaceutical Care)

Competence: The ability to perform one's duties accurately, make correct judgments, and interact appropriately with patients and colleagues. Professional competence is characterized by good problem-solving and decision-making abilities, a strong knowledge base, and the ability to apply knowledge and experience to diverse patient-care situations.

Competency: A distinct knowledge, skill, attitude or value that is essential to the practice of a profession. A pharmacist must master a variety of competencies to gain competence in his or her profession.

Compounding: Traditional pharmacy practice which includes the preparation, mixing, assembling, packaging, or labeling of a completed compounded preparation or administration device by compounding personnel: (1) as the result of a practitioner's prescription order or initiative based on the practitioner/patient/pharmacist relationship in the course of professional practice; (2) for the purpose of, or as an incident to, research, teaching, or chemical analysis, and shall not be dispensed for resale by a third party; (3) preparation of drugs or devices in anticipation of prescription orders to be received by the compounding pharmacist based on routine, regularly observed prescribing patterns; (4) preparation of completed compounded preparations for practitioner administration, pursuant to state and federal regulations; (5) preparation of Non-Legend completed compounded preparations, pursuant to state requirements; and (6) preparing completed compounded preparations for both human and non-food-producing animal patients. (Pharmacy Compounding Accreditation Board)

Continuing education: Continuing education for the profession of pharmacy is a structured educational activity designed or intended to support the continuing development of pharmacists and/or pharmacy technicians to maintain and enhance their competence. Continuing pharmacy education should promote problem-solving and critical thinking and be applicable to the practice of pharmacy.

Continuing professional development: The lifelong process of active participation in learning activities that assists individuals in developing and maintaining continuing competence, enhancing their professional practice, and supporting achievement of their career goals.

Credential: Documented evidence of professional qualifications. For pharmacists, academic degrees, state licensure, residencies, and Board certification are examples of credentials.

Credentialing: (1) The process of granting a credential (a designation that indicates qualifications in a subject or an area). (2) The process by which an organization or institution obtains, verifies, and assesses qualifications to provide patient-care services. (See also Privileging)

Direct patient care: Direct patient care practice involves the pharmacist's direct observation of the patient and his/her contributions to the selection, modification, and monitoring of patient-specific drug therapy. This is often accomplished within an interprofessional team or through collaborative practice with another healthcare provider. (American College of Clinical Pharmacy. Vision of the Future: Postgraduate Pharmacy Residency Training as a Prerequisite for Direct Patient Care Practice. Pharmacotherapy. 2006;26(5):722-733.)

Enteral administration: Administration that involves any part of the alimentary canal. (See also Parenteral)

Fellowship: A directed, highly individualized postgraduate program designed to prepare a pharmacist to become an independent researcher.

Formulary: A continually updated list of medications, related products, and information representing the clinical judgment of physicians, pharmacists, and other experts in the diagnosis and/or treatment of disease and promotion of health. Also referred to as a Preferred Drug List.

Formulary management: An integrated process of medication selection that enables physicians, pharmacists, and other healthcare professionals to work together to promote clinically sound, efficacious, safe, and cost-effective patient care. Formulary management provides the healthcare system with a rational, evidence-based process for evaluating and selecting from available medications those considered most useful in patient care.

Generalist: A practitioner who provides continuing, comprehensive, and coordinated care to a population regardless of age, gender, disease state, drug treatment category, or organ system. (Adapted from Schwinghammer TL. Defining the Generalist Pharmacy Practitioner. AJPE. 2004;68(3) Article 76.)

Health Management Organization (HMO): A form of health insurance in which its members prepay a premium for the HMO's health services, which generally include inpatient and ambulatory care. For the patient, it means reduced out-of-pocket costs (eg, no deductible), reduced paperwork (eg, insurance forms), and only a small co-payment for each office visit. (Adapted from Academy of Managed Care Pharmacy Glossary of Managed Care Terms available at www.amcp.org.)

Health Plan: A form of health insurance in which its members prepay a premium for health services, which generally include inpatient and ambulatory care.

Interdisciplinary: An interdisciplinary team includes members from different professions and occupations that work together closely and communicate frequently to optimize care for the patient. In addition to the term interdisciplinary, the literature refers to multidisciplinary and interprofessional. Multidisciplinary education and practice often is described as disciplines working in parallel, frequently with diverse goals. While the term interdisciplinary is arguably the most common in the literature, the term interprofessional is gaining currency, perhaps because medicine often uses interdisciplinary to describe collaboration between medical specialties. (Greiner A. Educating Professionals in Teams: Current Reality, Barriers, and Related Actions. Presentation. Institute of Medicine. http://www.iom.edu/?id=10487; Accessed November 5, 2008.)

Interprofessional: Involving members of different healthcare professions. (See also Interdisciplinary.)

License: A credential issued by a state or federal body that indicates that the holder is in compliance with minimum mandatory governmental requirements necessary to practice in a particular profession or occupation.

Licensure: The process of granting a license.

Managed Health Care: The sector of health insurance in which administrative health care organizations, or managed care organizations, manage the allocation of health care benefits. In contrast with conventional indemnity insurers, which do not govern the provision of medical services and simply pay for them, managed care organizations have a significant role in how the services are administered so that they may better control health care costs. Health maintenance organizations (HMOs) and preferred provider organizations (PPOs) are examples of managed care organizations. (Adapted from Academy of Managed Care Pharmacy Glossary of Managed Care Terms available at www.amcp.org.)

Managed Care Organization (MCO): A generic term applied to a managed care plan; includes a health maintenance organization (HMO), preferred provider organization (PPO), exclusive provider organization (EPO), health plan, or prescription benefit management company (PBM), although the MCO may not conform exactly to any of these formats. (Adapted from Academy of Managed Care Pharmacy Glossary of Managed Care Terms available at www.amcp.org.)

Medication therapy management: Medication therapy management is a distinct service or group of services that optimize therapeutic outcomes for individual patients. Medication therapy management services are independent of, but can occur in conjunction with, the provision of a medication product.

Parenteral: Administration by injection, eg, intravenous, intramuscular, or subcutaneous. (See also Enteral).

Pharmacist: A person licensed to engage in the practice of pharmacy.

Pharmacy [Practice of]: The interpretation, evaluation, and implementation of medical orders; the dispensing of prescription drug orders; participation in drug and device selection; drug administration; drug regimen review; the practice of telepharmacy within and across state lines; drug or drug-related research; the provision of patient counseling; the provision of those acts or services necessary to provide pharmacist care in all areas of patient care, including primary care and collaborative pharmacy practice; and the responsibility for compounding and labeling of drugs and devices (except labeling by a manufacturer, repackager, or distributor of nonprescription drugs and commercially packaged legend drugs and devices), proper and safe storage of drugs and devices, and maintenance of required records. The practice of pharmacy also includes continually optimizing patient safety and quality of services through effective use of emerging technologies and competency-based training. (NABP Model Act and Model Rules)

Pharmacy Benefit Management Company (PBM): An organization that manages pharmaceutical benefits for managed care organizations, other medical providers, or employers.

Pharmacy Technician: An individual who, under the supervision of a licensed pharmacist, assists in pharmacy activities not requiring the professional judgment of the pharmacist.

Preceptor: A practitioner who gives personal instruction, training, and supervision to a student or trainee in his or her practice or other places of work.

Privileging: The process by which a healthcare organization, having reviewed an individual healthcare provider's credentials and performance and found them satisfactory, authorizes that individual to perform a specific scope of patient-care services within that organization.

Registered: Adjective used to describe a pharmacist or pharmacy technician who has met state requirements for licensure or registration and whose name has been entered on a state registry of practitioners who are licensed or registered to practice in that jurisdiction.

Residency: An organized, directed, postgraduate training program in a defined area of pharmacy practice.

PGY1 Residency: Postgraduate year one of pharmacy residency training is an organized, directed, accredited program that builds upon knowledge, skills, attitudes, and abilities gained from an accredited professional pharmacy degree program. The first-year residency program enhances general competencies in managing medication-use systems and supports optimal medication therapy outcomes for patients with a broad range of disease states.

PGY2 Residency: Postgraduate year two of pharmacy residency training is an organized, directed, accredited program that builds upon the competencies established in postgraduate year one of residency training. The second-year residency program is focused in a specific area of practice. The PGY2 program increases the resident's depth of knowledge, skills, attitudes, and abilities to raise the resident's level of expertise in medication therapy management and clinical leadership in the area of focus. In those practice areas where board certification exists, graduates are prepared to pursue such certification.

Scope of Practice: The boundaries within which a health professional may practice. For pharmacists, the scope of practice is generally established by the board or agency that regulates the profession in a given state or organization.

Specialist: (1) A practitioner whose practice is limited to a particular class of patients (eg, children) or diseases (eg, infectious diseases, oncology, cardiology). (2) A practitioner who is qualified by advanced training and certification by a specialty examining board to so limit his or her practice.

Specialty: A recognized branch of a profession in which one specializes.

Statement of Continuing Education Credit: A document issued to an individual upon completion of a continuing education program provided by an organization accredited by the Accreditation Council for Pharmacy Education.

Traineeship: A short, intensive, clinical and didactic postgraduate educational program intended to provide the pharmacist with knowledge and skills needed to provide a high level of care to patients with specific diseases or conditions.

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Appendix A. Pharmacy organizations

Council on Credentialing in Pharmacy

Founded in 1999, the Council on Credentialing in Pharmacy (CCP) is a coalition of 13 national pharmacy organizations committed to providing leadership, guidance, public information, and coordination for credentialing programs in or relevant to pharmacy. The following organizations are members of CCP:

- Academy of Managed Care Pharmacy (AMCP)
- Accreditation Council for Pharmacy Education (ACPE) Commission for Certification in Geriatric Pharmacy (CCGP)
- American Association of Colleges of Pharmacy (AACP)
- American College of Apothecaries (ACA)
- American College of Clinical Pharmacy (ACCP)
- American Pharmacists Association (APhA)
- American Society of Consultant Pharmacists (ASCP)
- American Society of Health-System Pharmacists (ASHP)
- Board of Pharmaceutical Specialties (BPS)
- Institute for the Certification of Pharmacy Technicians (ICPT)
- National Alliance of State Pharmacy Associations (NASPA)
- Pharmacy Technician Certification Board (PTCB)
- Pharmacy Technician Educators Council (PTEC)

Joint Commission of Pharmacy Practitioners

Founded in 1977, the Joint Commission of Pharmacy Practitioners (JCPP) serves as a forum on matters of common interest and concern to national organizations of pharmacy

practitioners and invited liaison members. JCPP also provides a platform to create consensus in the pharmacy profession at the national level. The following organizations are members of JCPP:

- Academy of Managed Care Pharmacy (AMCP)
- American College of Apothecaries (ACA)
- American College of Clinical Pharmacy (ACCP)
- American Pharmacists Association (APhA)
- American Society of Consultant Pharmacists (ASCP)
- American Society of Health-System Pharmacists (ASHP)
- National Community Pharmacists Association (NCPA)

Liaison members

- Accreditation Council for Pharmacy Education (ACPE)
- American Association of Colleges of Pharmacy (AACP)
- National Alliance of State Pharmacy Associations (NASPA)
- National Association of Boards of Pharmacy (NABP)

Appendix B. Joint Commission of Pharmacy Practitioners: Future Vision of Pharmacy Practice 2015

The organizations of the Joint Commission of Pharmacy Practitioners (JCPP), including seven member pharmacy practitioner groups (Academy of Managed Care Pharmacy, American College of Apothecaries, American College of Clinical Pharmacy, American Pharmacists Association, American Society of Consultant Pharmacists, American Society of Health-System Pharmacists, National Community Pharmacists Association) and four liaison members (Accreditation Council for Pharmacy Education, American Association of Colleges of Pharmacy, National Association of Boards of Pharmacy, National Council of State Pharmacy Association Executives) have all endorsed the following common vision of the preferred future for pharmacy by the year 2015.

The JCPP Future Vision of Pharmacy Practice is a consensus document that articulates a vision for pharmacy and how it will be practiced. Equally important, the document describes how pharmacy practice will benefit society. The document was officially adopted by the JCPP members' executive officers following the November 2004 JCPP meeting and has subsequently been endorsed by each JCPP member's board of directors.

The stakeholders group identified and prioritized the top groups and organizations pharmacy must engage in efforts to work toward the vision of optimized medication use. While pharmacy intends to take leadership roles in improving the use of medications in health and wellness it cannot do so in isolation from the many others involved in the medication use process.

Future Vision of Pharmacy Practice Vision Statement

Pharmacists will be the healthcare professionals responsible for providing patient care that ensures optimal medication therapy outcomes.

Pharmacy practice in 2015

The Foundations of Pharmacy Practice. Pharmacy education will prepare pharmacists to provide patient-centered and population-based care that optimizes medication therapy; to manage healthcare system resources to improve therapeutic outcomes; and to promote health improvement, wellness, and disease prevention. Pharmacists will develop and maintain:

- A commitment to care for, and care about, patients
- An in-depth knowledge of medications and the biomedical, sociobehavioral, and clinical sciences
- The ability to apply evidence-based therapeutic principles and guidelines, evolving sciences and emerging technologies, and relevant legal, ethical, social, cultural, economic, and professional issues to contemporary pharmacy practice

How pharmacists will practice

Pharmacists will have the authority and autonomy to manage medication therapy and will be accountable for patients' therapeutic outcomes. In doing so, they will communicate and collaborate with patients, care givers, healthcare professionals, and qualified support personnel. As experts regarding medication use, pharmacists will be responsible for:

- rational use of medications, including the measurement and assurance of medication therapy outcomes
- promotion of wellness, health improvement, and disease prevention
- design and oversight of safe, accurate, and timely medication distribution systems

Working cooperatively with practitioners of other disciplines to care for patients, pharmacists will be:

- The most trusted and accessible source of medications and related devices and supplies
- The primary resource for unbiased information and advice regarding the safe, appropriate, and cost-effective use of medications
- Valued patient care providers whom healthcare systems and payers recognize as having responsibility for assuring the desired outcomes of medication use

How pharmacy practice will benefit society

Pharmacists will achieve public recognition that they are essential to the provision of effective health care by ensuring that:

- Medication therapy management is readily available to all patients
- Desired patient outcomes are more frequently achieved
- Overuse, underuse, and misuse of medications are minimized
- Medication-related public health goals are more effectively achieved
- Cost-effectiveness of medication therapy is optimized

Appendix C. Medication therapy management services

Definition and program criteria

Medication Therapy Management is a distinct service or group of services that optimize therapeutic outcomes for individual patients. Medication Therapy Management Services are independent of, but can occur in conjunction with, the provision of a medication product.

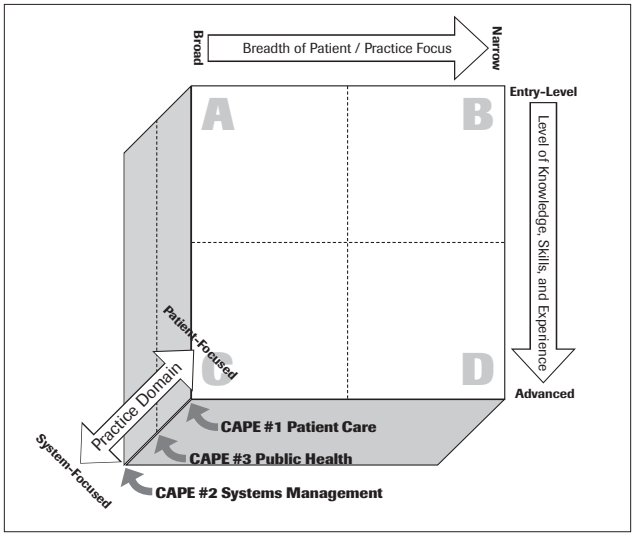
Medication Therapy Management encompasses a broad range of professional activities and responsibilities within the licensed pharmacist's—or other qualified healthcare provider's—scope of practice. These services include but are not limited to the following, according to the individual needs of the patient:

- Performing or obtaining necessary assessments of the patient's health status;
- Formulating a medication treatment plan;
- Selecting, initiating, modifying, or administering medication therapy;
- Monitoring and evaluating the patient's response to therapy, including safety and effectiveness;
- Performing a comprehensive medication review to identify, resolve, and prevent medication-related problems, including adverse drug events;
- Documenting the care delivered and communicating essential information to the patient's other primary care providers;
- Providing verbal education and training designed to enhance patient understanding and appropriate use of his/her medications;
- Providing information, support services and resources designed to enhance patient adherence with his/her therapeutic regimens;
- Coordinating and integrating medication therapy management services within the broader healthcare-management services being provided to the patient.

A program that provides coverage for Medication Therapy Management Services shall include:

- Patient-specific and individualized services or sets of services provided directly by a pharmacist to the patient*. These services are distinct from formulary development and use, generalized patient education and information activities, and other population-focused quality assurance measures for medication use.
- Face-to-face interaction between the patient* and the pharmacist as the preferred method of delivery. When patient-specific barriers to face-to-face communication exist, patients shall have equal access to appropriate alternative delivery methods. Medication Therapy Management programs shall include structures supporting the establishment and maintenance of the patient*-pharmacist relationship.
- Opportunities for pharmacists and other qualified healthcare providers to identify patients who should receive medication therapy management services.
- Payment for Medication Therapy Management Services consistent with contemporary provider payment rates that are based on the time, clinical intensity, and resources required to provide services (eg, Medicare Part A and/or Part B for CPT & RBRVS).
- Processes to improve continuity of care, outcomes, and outcome measures.

Approved July 27, 2004 by the Academy of Managed Care Pharmacy, the American Association of Colleges of Pharmacy, the American College of Apothecaries, the American College of Clinical Pharmacy, the American Society of Consultant Pharmacists, the American Pharmacists Association, the American Society of Health-System Pharmacists, the National Association of Boards of Pharmacy**, the National Association of Chain Drug Stores, the National Community Pharmacists Association and the National Council of State Pharmacy Association Executives.



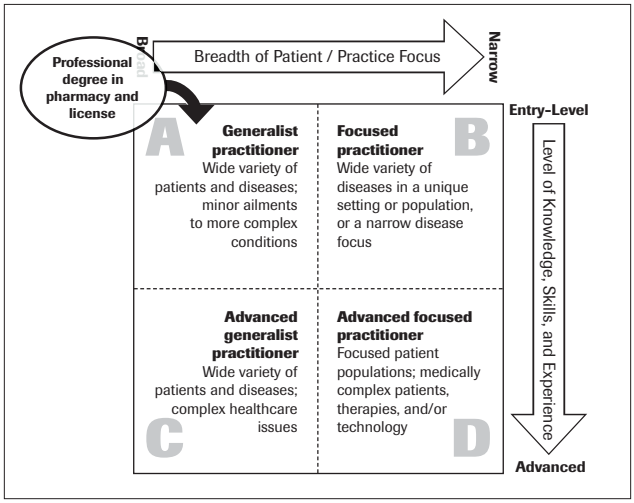


Figure 1 (top). Scope of pharmacy practice and professional competencies in the U.S.

Figure 2 (bottom). Practitioners in direct patient care.

**In some situations, Medication Therapy Management Services may be provided to the caregiver or other persons involved in the care of the patient.*

***Organization policy does not allow NABP to take a position on payment issues.*

Appendix D. Authorized activities for clinical pharmacists under a collaborative drug therapy management agreement*

Direct patient care

Conduct direct patient-care activities using a consistent approach that reflects the philosophy of primary care and pharmaceutical care. These activities include patient visits to establish therapeutic goals, drug-related physical assessment (eg, blood pressure checks), laboratory assessments, and follow up telephone calls.

Design, recommend, monitor, and evaluate patient-specific therapeutic regimens for primary care patients incorporating the principles of evidence-based medicine. Prescribing and drug-tailoring activities will be at the discretion of the Clinic Medical Director in collaboration with the Pharmacist.

1. Appropriately refer ambulatory-care patients to other healthcare practitioners including nutritionists, nurses, social workers, etc.
2. Provide education for patient self-management of their own health care to primary care patients and their caregivers.
3. Ensure continuity of pharmaceutical care between primary care and other healthcare settings.
4. Document pharmaceutical care activities appropriately in the medical record.
5. Integrate disease prevention and wellness promotion strategies into one's practice.

Prescription refill authorization

The pharmacist is authorized to manage refill-authorization requests from clinic patients and community pharmacies. In rendering refill-authorization decisions, the pharmacist will review the patient chart to assure that the decision and directions given to the requesting pharmacy is consistent with the treatment plan and therapeutic intent of the prescriber as documented in the chart. The pharmacist will also assess the appropriateness of the refill based on time since last clinic visit or time since specific procedure or test completed (INR, TSH, blood pressure, serum potassium, etc.). If specific information is absent (absence of data in the progress notes or lab sheet), a decision based upon professional judgment will be made and/or the physician will be consulted. Chart documentation will accompany these decisions.

Depending upon the clinical circumstances, the pharmacist may elect to authorize the refill, deny the refill, or authorize only a limited quantity pending a clinic visit.

Participate in drug information and drug policy development

1. Maintain a working knowledge of literature as it applies to their practice setting.
2. Incorporate this information in collaborative practice of evidence-based medicine.
3. Provide education to physicians, mid-level providers, nurses and other practitioners in the ambulatory-care setting regarding best prescribing patterns.

■ Participate in developing and evaluating therapeutic management policies in the ambulatory care clinic setting

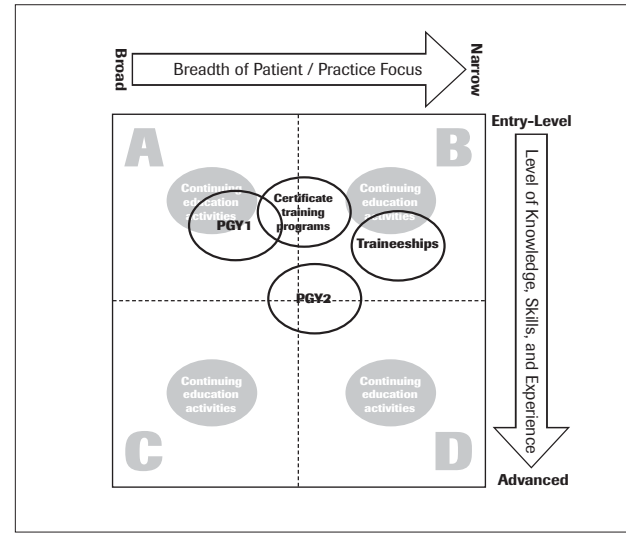


Figure 6. Post-licensure education and training relative to pharmacy practice

Legend: PGY1 = Post Graduate Year One (Residency), PGY2 = Post Graduate Year Two (Residency)

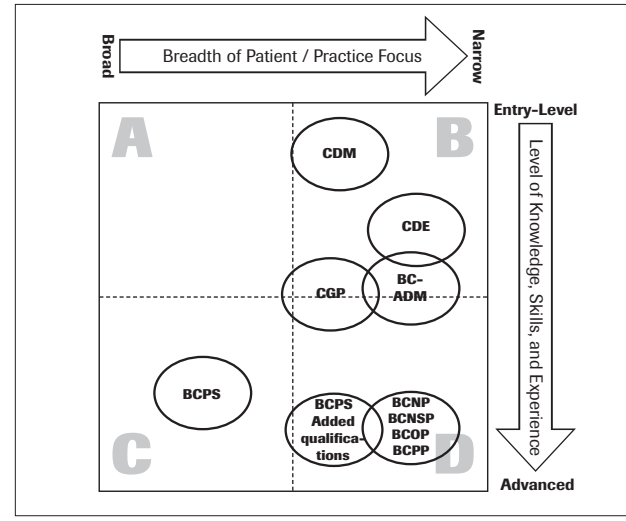


Figure 7. Post-licensure certification relative to pharmacy practice focus

Legend: BCADM = Board Certified–Advanced Diabetes Management, BCNP = Board Certified Nuclear Pharmacist, BCNSP = Board Certified Nutrition Support Pharmacist, BCOP = Board Certified Oncology Pharmacist, BCPP = Board Certified Psychiatric Pharmacist, BCPS = Board Certified Pharmacotherapy Specialist, CDE = Certified Diabetes Educator, CDM = Certified Disease Manager, CGP = Certified Geriatric Pharmacist

1. Development or modification of policies for the therapeutic management of patients in the ambulatory-care setting.
2. Participate in interdisciplinary performance improvement programs in the ambulatory-care environment.
3. Provide instruction to pharmacy technicians, pharmacy students, pharmacy residents, and other pharmacists.
4. Perform prospective and retrospective financial and clinical outcomes analyses and report these to the Board of Pharmacy on a quarterly basis.

(*Harborview Medical Center, Seattle, WA; August 2007; used with permission)

Appendix E. CCP framework for credentialing in pharmacy practice

Figures 1, 2, 6, and 7 below illustrate a framework for credentialing in pharmacy that has been embraced by CCP. While the framework has, to date, only been applied by CCP to pharmacists, it is likely that the same general principles can be applied to other categories of pharmacy personnel, such as pharmacy technicians. Using a three-dimensional model to encompass the major domains of pharmacy practice—Patient Care, Systems Management, and Public Health—the framework attempts to illustrate: (1) how a pharmacist's career may evolve or progress after completion of initial professional education, licensure, and entry to practice; (2) the post-graduate education and training activities and certifications undertaken by pharmacists; and (3) the correlations between credentialing, broad competency areas, scope of practice, and patient populations served. A brief description of each Figure provides further explanation. Although an oversimplification, CCP believes the framework will facilitate understanding of where credentialing fits into pharmacy practice.

Figure 1 depicts four possible quadrants (A through D) on the face of a cube showing how an individual pharmacist's professional career (scope of practice) may change over time. The horizontal (X) axis illustrates the breadth of patient or practice focus on a continuum from broad to narrow. The vertical (Y) axis illustrates the level (or depth) of knowledge, skills, and experience on a continuum from entry-level to advanced. The Y axis (moving down) could also denote an increasing level of complexity of care provided to patients and/or increasing degree of complexity of technology used in the provision of patient care (directly or indirectly). The third dimension (Z axis) accounts for the fact that while professional services provided by the majority of pharmacists ultimately contribute to patient care, some services (or domains of practice) are more direct in terms of contact with patients and others more indirect (ie, seldom, if ever, involving direct contact with patients). The Figure illustrates how the continuum of provision of patient care (from direct to indirect) correlates with the three CAPE Outcomes.

Figures 2, 6 and 7 deal only with the patient care domain, corresponding with CAPE Outcome #1. In Figure 2, the terms used to describe pharmacists in each of the quadrants are more descriptors than terms used in practice. A brief description of the patient population typically served by such pharmacists in each of the quadrants is provided. Figure 2 illustrates where and how a pharmacist after graduating from a professional degree program and obtaining a license enters the workforce and how he/she initially fits into the overall framework of professional practice in the direct patient care domain. After graduation, a majority of pharmacists practice as a Generalist Practitioner (Quadrant A). Generalist practitioners initially have entry-level knowledge, skills, and experiences while at the same time their breadth of patient focus is broad, reflecting their comprehensive professional education. With further practice experience and exposure to a larger cohort of patients and medical conditions, a pharmacist's breadth of patient or practice focus may expand, but certainly his/her level of knowledge and skills will advance, supported (at a minimum) by continuing education activities.

Quadrant A describes the patient population as a wide variety of patients and diseases; minor ailments to more complex conditions. In society, this represents the most populous patient group and this is where most pharmacists are needed—and choose—to practice. This quadrant reflects the practice of most community and hospital pharmacists. Pharmacists, who make a conscious decision to develop their professional careers in a specific way, will move into one of the other quadrants—B, C, or D. Such a conscious decision usually involves additional education, training, or credentialing, although specific practice experience and on-the-job training can achieve a comparable practice focus and level of knowledge and skills.

Pharmacists who elect to narrow their patient or practice focus (eg, in diabetes or geriatrics) will move into Quadrant B; they are described in the framework as Focused Practitioners. Their practice could be summarized as wide variety of diseases in unique setting or population, or narrow disease focus. An example of a pharmacist in this quadrant would be a pharmacist who focuses on geriatric care.

Pharmacists who elect to maintain a broad base of patients and diseases but who wish to substantially advance their level of knowledge, skills, and experience will move into Quadrant C. They can be described as Advanced Generalist Practitioners and the framework summarizes their practice as wide variety of patients and diseases; complex healthcare issues. An example of a pharmacist in this quadrant would be a pharmacotherapy specialist. Pharmacists in Quadrant D have both narrowed their patient/practice focus and substantially advanced their knowledge and skills. An example of an Advanced Focused Practitioner would be a Board Certified Oncology Pharmacist (BCOP), one of the recognized specialty credentials in the pharmacy profession.

Figure 6 depicts the range of post-licensure education and training activities pharmacists engage in to maintain their professional competencies and to support their con-

tinuing professional development. The most pervasive are continuing education (CE) activities which, in the majority of cases, are offered by ACPE-accredited providers of continuing pharmacy education. CE activities, appropriate to their practice, are offered to pharmacists in all four quadrants. Certificate Programs, which focus on the development of professional skills and their application in practice, would typically be undertaken by pharmacists in Quadrants A and B. From a patient/practice perspective, such programs may be broad or more focused. Traineeships, on the other hand, are more focused and would typically be undertaken by pharmacists with a narrower patient/practice focus (Quadrant B).

Post-Graduate Year One (PGY1) pharmacy residencies provide training for generalists in hospitals, health systems, managed care, or community settings, hence their depiction in Quadrant A in Figure 6. PGY1 residencies provide pharmacists with the opportunity to advance their knowledge, skills, and experience in an accelerated timeframe through a structured, practice-based training program. Most pharmacists who undertake a PGY1 residency do so in their first year after graduating. Post-Graduate Year Two (PGY2) residencies provide advanced training in a focused area of patient care. Residencies are typically one to two years in length and a PGY1 residency must be completed before going on to a PGY2 residency.

Figure 7 depicts post-licensure certifications and where they would typically apply to pharmacists in narrowly focused and/or advanced areas of practice. Detailed descriptions of these credentials have already been provided in CCP's resource document *Credentialing in Pharmacy*. As noted earlier, many pharmacists in the areas of practice represented by Quadrants B, C and D would have one or more of the certifications shown in Figure 7, but other pharmacists in these areas of practice would have comparable focus, knowledge, skills, and experience, and may have other credentials not included here.