Pharmacists’ Role in the Health Care System

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The evolution of the role of pharmacists in the American health care system took place in tandem with other changes. To best understand this historical transformation in the role of the pharmacist, from that of apothecary with a drug product focus to that of patient centered caregiver, it is important to examine parallel developments in pharmacy education, training, and practice.¹

During the 20th century, pharmacy training in the United States (US) consisted of a four- to five-year baccalaureate program and research-oriented pharmacy graduate training, primarily with master’s of science or doctor of philosophy degree paths.² In 1950, a six-year advanced clinical degree, the Doctor of Pharmacy (PharmD), was recommended to prepare some pharmacy practitioners for greater responsibility in advanced clinical practice; this education and training program would best prepare and position pharmacists for greater responsibilities for patient care.¹,³ In addition, clinical pharmacists were also participating in clinically oriented research. With the expansion of pharmacist participation in patient care, there was a realization that pharmacy education would need to become more extensive and clinically oriented. During the 1940s, a series of studies and reports advocated major changes in pharmacy education to meet the new demands of the profession and to enhance the health care system.³,⁸ In the 1960s, the pharmacy profession began to create new self-actualizing functions that moved pharmacy closer to the patient.¹ Subsequently, select pharmacy schools in the US changed their curricula or added an additional pathway for graduate pharmacists with the PharmD degree.⁶ In 1997, the American Council on Pharmaceutical Education (ACPE), the accreditation board for schools of pharmacy, formally adopted new accreditation standards and guidelines for a new PharmD curriculum as the sole professional training program for the profession. These standards became effective in 2000.⁹ This process has led to a steady increase in the number of pharmacy schools offering the PharmD as the sole first professional degree. As of the fall of 2005, there were eighty-nine colleges and schools of pharmacy in the US with accredited pro-

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Professional degree programs. As of Fall 2006, ninety-five colleges and schools will offer the PharmD degree as the first professional degree. Approximately sixty-eight graduate programs (MS and/or PhD level) in pharmaceutical sciences are currently offered in the US.

Upon graduation in the US, pharmacists must pass a licensing examination, the North American Pharmacist Licensure Examination (NAPLEX), developed by the National Association of Boards of Pharmacy. The NAPLEX is utilized by boards of pharmacy as part of their assessment of competent practice in pharmacy. Graduating pharmacists must also successfully pass the Multistate Pharmacy Jurisprudence Examination (MPJE), combining federal- and state-specific law questions and serving as the state law examination in participating jurisdictions. Pharmacists are required to obtain continuing education in pharmacy as a condition of licensure renewal.

Pharmacy education, training, and practice vary considerably across the globe, and pharmacy practice continues to evolve significantly. Many pharmacy schools outside of the United States have Bachelor of Pharmacy (BPharm) degree programs, along with tracks for master’s of science and doctor of philosophy degrees for those interested in graduate education. In the United Kingdom, pharmacy schools deliver a four-year master of pharmacy (MPharm) program. In other regions of the world, pharmacy schools are undergoing changes in order to modify or add pathways for students to transition to a clinically-oriented six-year Doctor of Pharmacy degree.

Concept of Pharmaceutical Care

The pharmacy profession has preserved its traditional core professional values, while transforming in certain fundamental ways over the past forty years, by embracing the concept of pharmaceutical care as described by Hepler and Strand. The mission of pharmacy in the 1990s was to embrace clinical opportunities and to promote added social responsibility for pharmaceutical health care. Though the 1960s saw the advent of clinical pharmacy practice, there was a period of professional transition in which pharmacists actually explored and defined what the specific opportunities and responsibilities would entail for clinical practice. For example, pharmaceutical care encompassed opportunities for the pharmacy profession to grow with an emphasis on the social responsibility to reduce preventable drug-related morbidity and mortality. Pharmacists continue to receive historical knowledge and skills regarding the composition and dispensation of drug entities and products, as well as traditional pharmaceutical care in which pharmacists can provide pharmaceutical services that can improve outcomes and reduce health care costs.

Documentation of Pharmacist-Provided Care

With the increase in patient care responsibilities, ways to assess the quality of pharmacists’ cognitive services became necessary. These types of assessments are important to determine the impact of the pharmacist’s services on patient outcomes, as well as on the health care system. In addition, pharmacists must be able to demonstrate the impact of clinical interventions and the quality and cost-effectiveness of that care to patients and third-party payers, in order to be compensated for patient services. A prospective, randomized trial to assess the cost impact of pharmacist-initiated

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interventions was conducted at a large university hospital wherein six pharmacists recorded patient-specific recommendations for 30 days. During the study period, all quality of care interventions were completed by the pharmacists; those interventions that were specifically aimed at reducing costs were stratified by drug class and randomized to an intervention or control group. In the intervention group, pharmacists contacted physicians with recommendations that were cost-saving, whereas in the control group patients were only observed. The majority of the 1226 (n = 967 [79%]) pharmacist interventions documented were aimed at improving quality of care; the remaining 259 interventions (21%) provided equivalent quality of care at cost savings. The cost savings for the institution extrapolated to an annual savings of approximately $394,000 (95% confidence interval, $46,000 - $742,000). Other studies have examined the role of the pharmacist in cost and clinical savings and have demonstrated positive outcomes. In 1999, the Institute of Medicine report highlighted the importance of reducing medical errors and called for fundamental changes in health care delivery. Pharmacists have been shown to prevent medication errors and minimize adverse effects. Medication safety continues to be a challenge within health care, and initiatives to improve medication safety have resulted in the formation of multidisciplinary health care teams focused on patient safety measures, as well as improvements in technology (e.g. computerized physician order entry) within the health care system. These practices have demonstrated improvements in the reduction of medication errors, with pharmacists well-positioned to participate as integral members of medication safety practices within the health care system.

Pharmacists provide patient counseling in a variety of settings. In the community pharmacy practice setting, pharmacists are easily accessible to patients and are sought out by patients for advice on over-the-counter products, complementary alternative therapies and nutritional supplements, medication adverse effects, drug-drug and/or drug-food interactions, or cost-related medication issues. In addition to patient counseling, an increasing number of community pharmacies offer pharmacist-run services, such as cholesterol and blood pressure screening, diabetes educational programs, and immunization programs. For example, pharmacists in many states can administer influenza vaccines and set up influenza clinics within pharmacies. In hospital settings, pharmacists may participate in patient care rounds with physicians and other health care providers, provide counseling to patients, and offer informational services to other health care providers. Pharmacists participate in key committees at institutions, including the Pharmacy and Therapeutics Committee, antibiotic monitoring committees and medication safety committees. Pharmacists also practice in many other settings such as ambulatory care clinics, managed care, and long-term care, and participate in a number of pharmaceutical services.

**Drug Information Services**

The provision of drug information (DI) to both patients and health care professionals is considered a basic responsibility of the pharmacist. Given the number of new drugs approved by the Food and Drug Administration (FDA) each year, as well as new indications for existing drugs, the pharmacist can serve as an excellent resource for both health care professionals and patients concerning the safety and efficacy of
medications. The pharmacist can also assist in the assessment of the reliability of information about drugs that one may receive. Pharmacists are now educated to critically evaluate clinical studies to assess for any potential bias that may be introduced either by limitations in the study methods employed or by funding sources (e.g. pharmaceutical companies). More and more information is also accessible via the Internet: a number of websites provide information on drug therapy and disease states. It is estimated that nearly 40% of Internet users search the web to find medical information. Since so many people use the Internet for health care related information, pharmacists can assist in determining whether this information is reliable.

There are a host of challenges faced by pharmacists when providing DI. One is that the needs of individuals requesting information vary considerably, and the means of communicating the information with them differ as well. Patients typically have personal concerns about the use of a medication either for themselves or a family member and generally need to be communicated with in lay terms that they can understand rather than complex medical jargon. On the other hand, physicians and other health care providers are generally interested in information about a drug for treating a specific patient. In this situation, it is critical that the pharmacist obtain additional patient information in order to provide as accurate a response as possible. For example, a recommendation for a dose of a drug can be greatly influenced by a patient’s medical history or other drugs he or she may be taking. Unfortunately, many times the pharmacist does not have ready access to this information, especially in the community practice setting, and may meet some resistance when trying to obtain it.

While most pharmacists are able to provide DI to patients and clinicians, there are pharmacists who specialize in this area as well. In fact, the concept of DI was originally identified in the 1960s with either a specific drug information center (DIC) or drug information specialist. The first DIC was established at the University of Kentucky Medical Center in 1962, as a separate area within the pharmacy department dedicated to providing DI services. Early DICs were under the direction of specialists, many of whom were pharmacists who had additional training in the area of drug information. Currently, there are over a hundred DICs in the United States, although this number has declined over recent years as more pharmacists are providing DI services as part of their routine responsibilities. In addition, curriculum changes in schools of pharmacy have also better prepared pharmacists to assume the role of “DI specialist.”

Most DICs are affiliated with either medical centers or schools of pharmacy. These centers have a variety of print and electronic information resources to assist pharmacists responding to DI inquiries. In addition to answering DI questions, pharmacists who staff these DICs also may participate in adverse drug reaction (ADR) programs, prepare newsletters on new drugs or drug administration policies for the institution, and provide in-service education programs to physicians and nurses. In addition, DIC pharmacists may provide significant input in the process of deciding what drugs will be available on the hospital’s formulary.

The Massachusetts College of Pharmacy and Health Sciences recently established a Center for Drug Information and Natural Products (CDINP) which services the local community and serves as an experiential education site for sixth year Doctor of Pharmacy students. In addition to courses offered in the Doctor of Pharmacy curriculum, the training the students
receive through this CDINP experience will better position them to be DI resources regardless of where they eventually practice.

The increased use of natural products in the US has made it important that information about their efficacy and safety be available to both consumers and clinicians. While there is still a lack of data regarding the appropriate use of many natural products with more traditional medication, the CDINP has a variety of databases available to help individuals make informed decisions concerning the use of these products as well as allopathic medicines. The CDINP also provides DI support for Mass Medline, a state-funded program to assist patients in identifying appropriate insurance coverage or pharmaceutical company assistance programs to help with prescription medication access.

In addition to providing DI to patients and health professionals, the pharmacist can also serve as a resource in developing both formulary policy decisions and disease state management strategies concerning cost-effective drug use. Many organizations have implemented programs to encourage clinicians to use less expensive therapeutic options when possible. Pharmacists and clinicians generally work together to develop the most appropriate strategy, based on both clinical experience and support from the scientific literature. Studies have shown that pharmacists who initiate clinical interventions can bring about improved patient care and cost savings to an organization.17-19

Pharmacists’ Role Under the Medicare Modernization Act of 2003 (MMA)

As most individuals following health care reform are aware, effective January 1, 2006, the 2003 MMA provides for outpatient prescription drug benefits for Medicare beneficiaries, commonly known as Medicare Part D. Although the expanded prescription drug coverage for this population has received most of the attention, the MMA also provides for certain Medicare beneficiaries to receive Medication Therapy Management (MTM) services as part of the expanded drug benefits. In MTM programs, pharmacists, physicians and other health care professionals collaborate to monitor patients on more complex drug therapy regimens to thereby improve therapeutic outcomes. It is estimated that individuals over sixty-five years of age take an average of five or more drugs each.29 Patients with chronic conditions and taking multiple medications are at increased risk for developing drug related complications, which increase costs as well. In 2000, the estimated annual cost of medication related problems in outpatients was $177.4 billion, an increase of over $100 billion from the previous 5 years.30 It is expected that these costs will continue to rise as our population ages. In order to address concerns about rising costs, the MMA requires that Part D prescription drug plans (PDPs) pay for MTM services to assure safe and effective drug use in patients with chronic diseases and/or on multiple medications. The law states that these services can be provided by a pharmacist, which is the first time Medicare will require payment for pharmacists’ services related to patient care.31

Some examples of services provided by pharmacists in MTM programs include selecting or initiating drug therapy, monitoring therapy and making recommendations for necessary changes, counseling patients on the appropriate use of medications, conducting wellness and disease prevention programs, and overseeing medication use in a variety of prac-
Pharmacy practice in areas such as community pharmacy, hospital pharmacy, long-term care, ambulatory care clinics, managed care, academic pharmacy, and the pharmaceutical industry. Many pharmacists specialize in a particular area such as infectious diseases, cardiology or oncology. Pharmacists who specialize in a field generally have additional post-graduate training in the form of either a pharmacy residency or fellowship.

Pharmacy residency programs primarily focus on enhancing the clinical training of the pharmacy practitioner. Residency programs are generally one year in length and may provide broad training (pharmacy practice for instance) or specialized training (such as pediatrics, cardiology and oncology). Community pharmacy practice and ambulatory care, primary care, or family practice pharmacy residency programs also provide excellent opportunities to enhance pharmacy practice skills in a clinical setting. Many specialized residency programs require prior experience such as a pharmacy practice residency.

Pharmacy fellowships have been the primary mechanism for training pharmacists to conduct clinical research. Fellowship programs, generally two years in length, often require the practitioner to have prior practice experience and some research experiences (often prior residency training). These programs usually are designed in a specialized area and/or disease state, such as pharmacokinetics, infectious diseases, or cardiology. Some fellowship programs may offer the opportunity to complete graduate level coursework or may require a graduate degree such as a master's degree in science or public health. Some pharmacy schools have designed graduate programs to provide an alternative option for pharmacists who are motivated to pursue a career path as a clinical pharmaceutical scientist. There are

Postgraduate Training

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a few institutions that offer PhD degree programs that emphasize the integration of both clinical and basic science research interests, and there are others that allow the student to select a basic science or clinical science research track. These programs are different from the traditional PhD programs, such as pharmaceutics or medicinal chemistry, which often lack a clinical emphasis.

Certifications

In addition, pharmacists may become board-certified in a particular area. While licensure establishes a minimum competency for the practice of pharmacy, certification establishes that knowledge and experience beyond that level has been acquired. The Board of Pharmaceutical Specialties (BPS) was formed in 1976 to recognize specialties within pharmacy practice, to set standards for certification and recertification, and to be the coordinating agency for pharmacy specialties. Board certification provides a method for employers, health care professionals, health care administrators, patients and third-party payers to determine whether pharmacists have the expertise to practice in these specialized areas. To become certified, a pharmacist must have a minimum level of practice experience in his or her area of specialty and must complete a rigorous certification examination. Individuals must be recertified every seven years. There are currently five recognized specialty areas within pharmacy: nuclear pharmacy, nutrition support pharmacy, pharmacotherapy, psychiatric pharmacy and oncology pharmacy. The most recent data available from the BPS indicates that nearly 4,500 pharmacists are certified in some area of specialization.

Conclusion

The pharmacy profession has undergone significant changes in the past sixty years, evolving into a patient care focused approach. Pharmacy education and training have been revised to prepare future pharmacists for careers in pharmaceutical care, and post-graduate training opportunities and certification programs have been instrumental in training pharmacists for future practice in innovative patient settings. Pharmacists have expanded their roles in practice settings and now serve as integral members of an interdisciplinary health care system. It will now be important to determine how the public will respond to a more patient-centered pharmacy practice.

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