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THE PRESENT AND FUTURE

COUNCIL PERSPECTIVES

The Role of the Clinical Pharmacist in the Care of Patients With Cardiovascular Disease

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ABSTRACT

Team-based cardiovascular care, including the use of clinical pharmacists, can efficiently deliver high-quality care. This Joint Council Perspectives paper from the Cardiovascular Team and Prevention Councils of the American College of Cardiology provides background information on the clinical pharmacist's role, training, certification, and potential utilization in a variety of practice models. Selected systematic reviews and meta-analyses, highlighting the benefit of clinical pharmacy services, are summarized. Clinical pharmacists have a substantial effect in a wide variety of roles in inpatient and ambulatory settings, largely through optimization of drug use, avoidance of adverse drug events, and transitional care activities focusing on medication reconciliation and patient education. Expansion of clinical pharmacy services is often impeded by policy, legislation, and compensation barriers. Multidisciplinary organizations, including the American College of Cardiology, should support efforts to overcome these barriers, allowing pharmacists to deliver high-quality patient care to the full extent of their education and training. (J Am Coll Cardiol 2015;66:2129–39)

The American College of Cardiology (ACC) Board of Trustees and Strategic Plan endorse team-based care as a means to address the growing cardiovascular disease (CVD) epidemic (1,2). With a critical shortage of cardiologists, it is important that collaboration is developed with nonphysician providers, including clinical pharmacists, as an efficient and cost-effective means to improve patient outcomes. As with other qualified nonphysician practitioners, clinical pharmacists are underutilized; a 2009 ACC survey demonstrated that many cardiologists are unfamiliar with how best to apply a nonphysician team approach to patient care (3). Importantly, the major application of a clinical pharmacist to direct patient care is team-centric and not independent of physicians or other licensed providers.

Patients with CVD are at significant risk for adverse drug events and medication errors due to polypharmacy (4,5); they also have proportionally greater utilization of high-risk medications, such as anticoagulant agents. By focusing on preventing

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Listen to this manuscript's audio summary by *JACC* Editor-in-Chief Dr. Valentin Fuster.

ABBREVIATIONS AND ACRONYMS

ACC = American College of Cardiology

ACCP = American College of Clinical Pharmacy

ACPE = American College of Pharmaceutical Education

BPS = Board of Pharmacy Specialties

CPA = collaborative practice agreement

CPS = clinical pharmacy services

CVD = cardiovascular disease

medication-related adverse events and error, financial waste related to these events can be decreased and patient outcomes improved (6,7). In addition, patients with CVD are often underprescribed critical, evidence-based therapies for a variety of reasons (8,9). Clinical pharmacists are pharmacists who, through advanced training, experiences, and/or certification requirements for licensure as a general pharmacist, have the skills and knowledge to provide clinical pharmacy services (CPS) to the health care team and patients. CPS includes, but is not limited to, complex medication management, transitional care related to medications, and patient or clinician medication education (10). A summary of CPS is included in the **Central Illustration**, demonstrating that the clinical pharmacist may operate on a patient-specific, facility, or global level to achieve optimal medication outcomes. The American College of Clinical Pharmacy (ACCP) defines CPS as, "a health sciences discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention" (11). Clinical pharmacists also play a pivotal role in ensuring medication safety, either through specific medication interventions or in designing macroprocesses to reduce the medication-related risk of error. In the MEDAP (Medication Error Detection, Amelioration, and Prevention) study, an observational analysis of clinical pharmacists engaged in patient safety initiatives, cardiovascular drugs comprised the third most-commonly prescribed class of medications resulting in errors that required pharmacist intervention (12). Clinical pharmacists are uniquely positioned to address medication safety, due to their intimate understanding of the medication-use process and clinical pharmacology.

To maximize the role of the clinical pharmacist, the care team will benefit from understanding the training, development, utilization, and potential value of the clinical pharmacist in the cardiovascular care team. This paper will provide background information on clinical pharmacists' education, training, credentialing, and practice models in a variety of settings; it will also discuss collaborative practice opportunities for integrating clinical pharmacists into a team-based care model.

TRAINING AND CERTIFICATION

Figure 1 depicts the typical training pathway of a clinical pharmacist working in cardiovascular practice. There are currently 134 schools and colleges of pharmacy in the United States, a number that continues to grow (13). Pharmacy school training is preceded by a minimum of 2 years of undergraduate coursework, although many students have completed a bachelor's degree. Most pharmacy school curricula consist of 3 years of didactic coursework, followed by a fourth year of experiential education. The Doctor of Pharmacy (PharmD) degree is awarded upon graduation. Curricula must meet the core standards overseen by the American College of Pharmaceutical Education (ACPE), which have been recently updated (14). Integration of interprofessional education into curricula is recommended by the ACPE to better prepare students to provide patient-centered care. This involves pharmacy students interacting with medical, nursing, and other health professional students at various levels of training in coordinated educational or patient care activities (14). Introductory pharmacy practice experiences are completed in community pharmacy and hospital settings during the first 3 years, whereas advanced pharmacy practice experiences occur in the final year of school. The ACPE requires that these advanced experiences involve direct patient care, interactions with prescribers, and the provision of CPS alongside and supervised by clinical pharmacists (14,15).

Post-graduate education and training for a cardiovascular clinical pharmacist may differ from that of pharmacists working in other settings. Following graduation from an ACPE-accredited school of pharmacy, approximately 25% of pharmacists choose to continue their education in the form of either residency and/or fellowship training. These programs continue to grow in response to increased demand (16). A post-graduate year (PGY)-1 pharmacy residency program is intended to produce pharmacy practitioners competent in patient-centered care and pharmacy operational services that can be applied to any practice setting (17). Individuals desiring more specialized clinical training in a cardiovascular area can complete a PGY2 residency. The aim of a PGY2 pharmacy residency in cardiology is to train pharmacy practitioners in the care of patients with CVD, both from a prevention and treatment perspective (18). Cardiology pharmacy residency programs also train in the conduct of clinical research projects, the interpretation of cardiovascular biomedical published data, quality improvement initiatives, leadership and practice management, teaching and educational activities, and advocacy for CVD prevention. The American Society of Health-System Pharmacists currently lists 29 PGY2 training programs in cardiology pharmacy; these programs have collectively graduated at least 123 graduates since 2007 (19).