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THE ROLE OF INTEGRATED CLINICAL SERVICES IN EARLY DISEASE DETECTION: A COLLABORATIVE APPROACH REVIEW

Wafa Abdullah Alshareef*, Salah Mohammed Alshaghroud, Saleh Abdullah Altwaijri, Ali Mesfer Alkhathami, Reef Ibrahim Mohammed Alruqaie, Awadh Mutab Alharbi, Adhah Zabbar H. Almarzuqi, Mutlaq Shabab Huwaydi Alotaibi, Mesfer Hamed M Almalki, Abdullah Mohammed Abdullah Alyamani, Mohammed Hassan Albather and Tahani Mohammed Hassan Alqorashi

Ministry of National Guard Health Affairs.
https://shorturl.at/7pkgp

***Corresponding Author: Wafa Abdullah Alshareef**
Ministry of National Guard Health Affairs.
https://shorturl.at/7pkgp

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ABSTRACT

Background: The increasing prevalence of cardiovascular diseases and the shortage of cardiologists necessitate innovative healthcare strategies. Collaborative Clinical Pharmacy Services (CPS) play a critical role in enhancing patient outcomes by integrating clinical pharmacists into the cardiovascular care team. **Methods:** This review evaluates existing literature on the implementation of CPS within multidisciplinary healthcare settings. We analyzed studies focusing on the roles of clinical pharmacists in medication management, patient education, and adherence to evidence-based therapies. Data from randomized controlled trials, meta-analyses, and observational studies were synthesized to assess the impact of CPS on cardiovascular patient care. **Results:** The findings indicate that the integration of clinical pharmacists significantly improves medication adherence, reduces adverse drug events, and enhances overall patient outcomes in cardiovascular disease management. Pharmacists actively participating in patient rounds, conducting medication reviews, and providing education led to a notable decrease in hospitalization rates and improved management of cardiovascular risk factors. Specifically, pharmacist-led interventions demonstrated substantial improvements in medication adherence rates, with studies reporting adherence increases of over 15%. **Conclusion:** Collaborative Clinical Pharmacy Services are essential in optimizing cardiovascular care by ensuring safe and effective medication use. The inclusion of clinical pharmacists in healthcare teams can address gaps in patient management, improve health outcomes, and reduce healthcare costs. Future healthcare models should prioritize the integration of clinical pharmacists to enhance patient-centered care in cardiovascular practices.

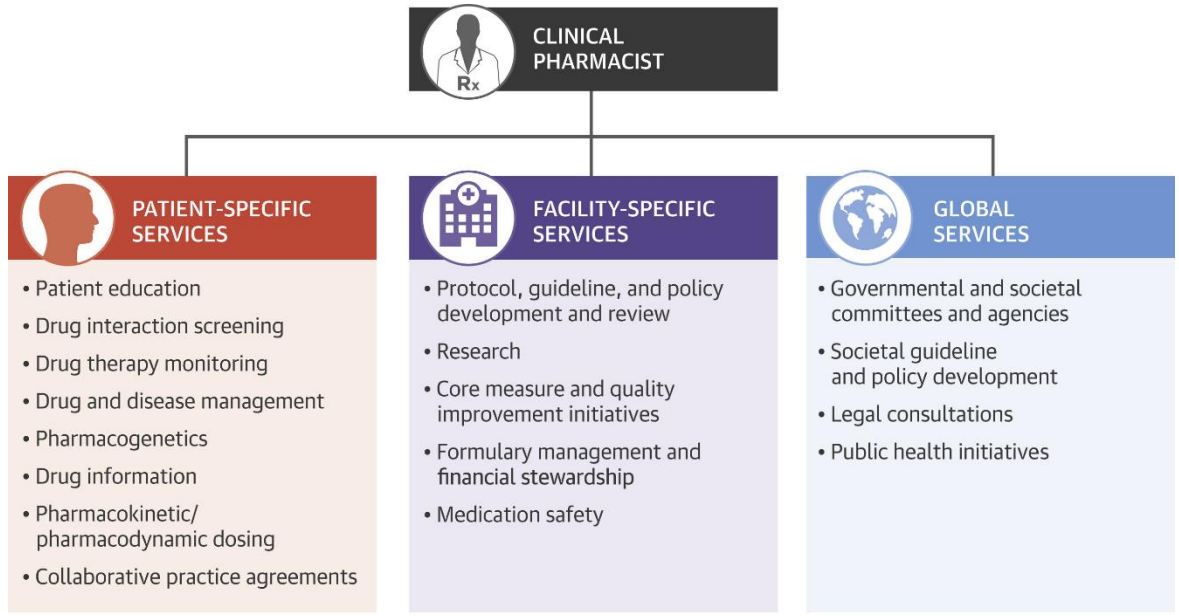
KEYWORDS: Clinical Pharmacy Services, Cardiovascular Care, Medication Management, Patient Education, Healthcare Integration.

1. INTRODUCTION

Given the acute scarcity of cardiologists, it is essential to foster cooperation with nonphysician clinicians, such as clinical pharmacists, as an effective and economical strategy to enhance patient outcomes. Similar to other competent nonphysician practitioners, clinical pharmacists are underused; a 2009 ACC study revealed that several cardiologists lack familiarity with the optimal implementation of a nonphysician team approach to patient care.[1-3] The primary role of a clinical pharmacist in patient care is collaborative and not autonomous from doctors or other licensed practitioners.

Patients with cardiovascular disease are at considerable risk for adverse drug events and medication mistakes owing to polypharmacy; they also exhibit a higher consumption of high-risk drugs, including anticoagulants. Concentrating on the prevention of medication-related adverse events and errors might reduce financial waste associated with these incidents and enhance patient outcomes.[6,7] Moreover, patients with cardiovascular disease often get insufficient prescriptions for essential, evidence-based treatments due to several factors.[8,9] Clinical pharmacists are pharmacists that possess the expertise and knowledge to provide clinical pharmacy services (CPS) to the healthcare team and patients, acquired via increased training, experience, and/or certification prerequisites for licensing as a general pharmacist. CPS include, but is not limited to, intricate medication management, transitional care pertaining to drugs, and educational initiatives for patients or clinicians about medications.[10]

The Central Illustration provides an overview of CPS, indicating that the clinical pharmacist may function at a patient-specific, facility, or global level to get optimum drug results. The American College of Clinical Pharmacy (ACCP) characterizes Clinical Pharmacy Services (CPS) as a health sciences specialty whereby pharmacists provide patient care that enhances drug treatment and fosters health, wellness, and disease prevention. Clinical pharmacists play a crucial role in maintaining drug safety, either via targeted pharmacological treatments or by creating macroprocesses that mitigate the risk of medication errors. In the MEDAP (Medication Error Detection, Amelioration, and Prevention) study, an observational analysis of clinical pharmacists involved in patient safety initiatives revealed that cardiovascular drugs constituted the third most frequently prescribed category of medications associated with errors necessitating pharmacist intervention.[12] Clinical pharmacists are distinctly equipped to enhance drug safety, owing to their profound comprehension of the medication-use process and clinical pharmacology.



Dunn, S.P. et al. J Am Coll Cardiol. 2015; 66(19):2129-39.

Figure 1: Clinical Pharmacists: Their Function in Cardiovascular Disease.

To optimize the clinical pharmacist's position, the care team must comprehend the training, development, application, and prospective value of the clinical pharmacist within the cardiovascular care team. This article will provide background information on the education, training, credentialing, and practice models of clinical pharmacists across various contexts, as well as examine collaborative practice potential for incorporating clinical pharmacists into a team-based care paradigm.

2. Instruction and Accreditation

Figure 1 illustrates the standard training trajectory of a clinical pharmacist specializing in cardiovascular practice. Currently, there are 134 schools and colleges of pharmacy in the United States, a figure that continues to increase. Pharmacy school education requires at least 2 years of undergraduate study, while some students possess a bachelor's degree. The majority of pharmacy school programs have three years of theoretical instruction, followed by a fourth year of practical training. The Doctor of Pharmacy (PharmD) degree is conferred following completion of the program. Curricula must comply with the fundamental requirements established by the American College of Pharmaceutical Education (ACPE), which have been recently revised. The ACPE recommends the incorporation of interprofessional education into curriculum to enhance students' preparedness for delivering patient-centered care. This entails pharmacy students engaging with medical, nursing, and other health professional students across different training stages in synchronized instructional or patient care initiatives.[14] Introductory pharmacy practice experiences are undertaken in community pharmacies and hospital environments throughout the first three years, whereas advanced pharmacy practice experiences take place in the last year of the program. The ACPE mandates that these advanced experiences include direct patient care, engagement with prescribers, and the delivery of Clinical Pharmacy Services under the supervision of clinical pharmacists.[14,15]

Postgraduate education and training for a cardiovascular clinical pharmacist may vary from those of pharmacists in other environments. Upon graduating from an ACPE-accredited pharmacy school, over 25% of pharmacists choose to pursue further study via residency and/or

fellowship training. These initiatives are expanding in response to heightened demand.[16] A post-graduate year (PGY)-1 pharmacy residency program aims to cultivate pharmacy practitioners proficient in patient-centered care and pharmacy operational services applicable across various practice environments.[17] Individuals seeking advanced clinical training in a cardiovascular specialty may pursue a PGY2 residency. The objective of a PGY2 pharmacy residency in cardiology is to educate pharmacy practitioners in the management of patients with cardiovascular disease, including both preventive and therapeutic approaches. Cardiology pharmacy residency programs also include training in the execution of clinical research projects, the analysis of published cardiovascular biomedical data, quality improvement efforts, leadership and practice management, educational activities, and advocacy for cardiovascular disease prevention. The American Society of Health-System Pharmacists now identifies 29 PGY2 training programs in cardiac pharmacy, which have combined produced a minimum of 123 graduates since 2007.[19]

A clinical research fellowship is a specialized postgraduate program aimed at training pharmacists to become autonomous researchers (Figure 1). The objective is for graduates to acquire proficiency in all facets of the scientific research process, including hypothesis formulation, manuscript preparation, and publishing. Fellowships are available in several environments, such as pharmacy schools and colleges, the pharmaceutical sector, and academic health institutions. Similar to PGY2 residency programs, fellowships often concentrate on a particular area of pharmacy practice. The ACCP provides a peer-review designation for eligible programs and enumerates six fellowship programs with a major or secondary focus in cardiology.

In addition to formal education and clinical training, pharmacy employs systems to verify that entry-level practitioners have achieved the requisite credentials via certification.[20] For the majority of healthcare professions, the preliminary measure to establish eligibility for practice is via license. In addition to licensing, the certification process for pharmacists differs from that of doctors and nonphysician practitioners. Certification for pharmacists is optional and includes both pharmacist-specific and interdisciplinary certificates.[21] The Board of Pharmacy Specialties (BPS) is a prominent institution with an extensive history of granting specialized certification credentials to pharmacists. The objective of the BPS is to acknowledge pharmacy specialty practice and certify pharmacists' expertise and proficiency in nuclear, nutrition support, oncology, pharmacotherapy, ambulatory care, pediatrics, critical care, and psychiatric pharmacy; cardiology specialty certification is under consideration as well. To qualify for certification via BPS, one must possess a pharmacy license and provide evidence of three years of experience in a practice area or the completion of a PGY1 and/or PGY2 residency, in addition to successfully completing a standardized written test. Pharmacists may get certification in certain subspecialties via the BPS, including further certifications in cardiology[22], which include engagement in specialty-related practice, education, research, and scholarship. As of 2013, approximately 19,000 pharmacists have been certified by the BPS, with more than 100 practitioners obtaining additional certifications in cardiology.

Pharmacists may also get comprehensive, interdisciplinary qualifications including several aspects of cardiovascular disease. These credentials evaluate health care-related competencies across several professions, including nurses, nurse practitioners, and physician assistants. The eligibility criteria for each of them generally rely on the provision of practice documents and the successful completion of an examination.[24,25]

3. Pharmacist Practice Models and Clinical Interventions

The advantages of CPS in federal, nonfederal, hospital, clinic, managed care, and other community environments have been well recorded.[26] Nonetheless, a cohesive national model of CPS is absent; procedures may differ across institutions. Clinical Practice Standards (CPS) have been linked to reduced healthcare expenditures, lower hospital mortality rates, diminished drug expenses, shorter lengths of stay, and lowered prescription mistake rates.[27–29] The Institute of Medicine acknowledges that teamwork among pharmacists, physicians, and patients enhances pharmaceutical safety.[30] Engaging with the healthcare team during inpatient rounds, conducting interviews with patients and their families, selecting and reconciling medications, performing dose titration, facilitating insurance coverage, and offering patient discharge counseling and follow-up are among the numerous contributions of clinical pharmacists that have led to enhanced outcomes in the inpatient environment.[31–33] Engaging with a pharmacist in the inpatient environment has enhanced post-discharge medication adherence[31,34], diminished adverse drug reactions and medication mistakes[31], and reduced hospital length of stay.[31]

Numerous studies and meta-analyses have shown the impact of CPS in cardiovascular patients (Table 2). Clinical pharmacists have enhanced the treatment of cardiovascular disease risk factors.[35–39] The findings align with previous research demonstrating enhancements in cardiovascular disease risk factor management by pharmacists in primary care settings[40,41], cardiology clinics[42,43], a managed care organization[44], and a retail pharmacy environment.[45] The incorporation of inpatient and outpatient CPS led to enhanced treatment, with no indications of adverse effects.

Clinical pharmacists have shown a significant impact on patients with heart failure. Gattis et al.[46] conducted a single-center, randomized clinical study involving 180 heart failure patients to assess the impact of pharmacist involvement in heart failure rounds for inpatient treatment. The composite of all-cause mortality and heart failure events was markedly reduced at 6 months in the group with pharmacist involvement (4 occurrences vs. 16 events [all-cause mortality or heart failure]; $p = 0.005$). Pharmacists' management of inpatients and outpatients with heart failure has led to a reduction in hospitalizations[47,48] and readmissions.[48] The Heart Failure Society of America recently collaborated with the ACCP Cardiology Practice and Research Network to produce a joint opinion paper that delineated and endorsed the responsibilities of pharmacists within multidisciplinary heart failure teams.[10]

Clinical pharmacists can conduct various patient care services simultaneously or in conjunction with physician practice, such as medication reviews, patient education and counseling, disease screening, and referrals. Additionally, they may engage in independent direct medication management through a collaborative practice agreement (CPA), thereby enhancing the range of services they offer. Certified Public Accountants who incorporate a pharmacist might mitigate part of the need for treatment supplied by physicians. CPAs establish a formal association between physicians and pharmacists, delineating patient care responsibilities (e.g., patient evaluations, counseling, referrals; ordering laboratory tests; administering medications; and selecting, initiating, monitoring, continuing, and modifying drug regimens) that a pharmacist may independently execute within a protocol framework. Certified Pharmacy Technicians (CPAs) are not a recent development; federal pharmacists have jointly administered illness management via pharmaceutical use, cognitive services, and Collaborative Practice Agreements (CPS) for more than four decades.[49] With a CPA established, a qualified healthcare professional diagnoses and oversees patient treatment continuously. Presently, 46 states and the District of Columbia permit various forms of CPAs. CPA regulations differ significantly across states regarding the scope of pharmacists' authorized services, restrictions on practice locations and health conditions, the power to order laboratory tests, and the prerequisites for pharmacist involvement (such as certification, training, or advanced licensure requirements or designations).

Kaiser Permanente of Colorado employs a collaborative practice paradigm whereby nurses and clinical pharmacists engage in direct patient care under the supervision of a physician. This model significantly decreased all-cause mortality (adjusted hazard ratio: 0.24; 95% confidence interval: 0.20 to 0.29; $p < 0.001$) and coronary heart disease-related mortality (adjusted hazard ratio: 0.27; 95% confidence interval: 0.22 to 0.34; $p < 0.001$) in patients with coronary artery disease monitored for over 3 years in the program. Patients participated within 90 days ("early exposure") after their coronary incident had reduced all-cause mortality across a 10-year follow-up compared to other patient groups not engaged within this timeframe (4.7% early vs. 8.6% delayed, 16.4% intermittent, and 46.9% none; $p < 0.001$).[50] Patients often engage in the nurse-managed cardiac rehabilitation program 3 to 6 months post-discharge after a coronary incident, subsequently enrolling in the pharmacist-managed program. The objectives were to enhance the use of evidence-based medicines, facilitate the monitoring and management of disorders that elevate cardiovascular disease risk (e.g., hypertension, hyperlipidemia, diabetes, and substance abuse), and disseminate information to patients and other team members.[51]

Ripley et al.[52] provide a comprehensive description of a comparable practice model that employs cooperation between cardiologists and clinical pharmacists for the long-term care of patients with cardiovascular disease in both an academic faculty-based setting and a private sector specialty clinic. The practice model is organized based on a specified scope-of-practice agreement between cardiologists and pharmacists.[52] The participation of pharmacists has been shown to enhance drug adherence. A recent research by Ho et al.[53] assessed a comprehensive intervention aimed at enhancing medication adherence, which included pharmacist-led medication reconciliation, education, and collaborative care between pharmacists and clinicians within the Veterans Affairs health system. Patients assigned to the intervention had superior adherence to cardiovascular drugs (clopidogrel, beta-blockers, statins, and angiotensin inhibitors) compared to the usual care group (89.3% vs. 73.9%; $p = 0.003$).[53]

4. Professional Competence

In 2012, a consortium of stakeholders recognized successful policies, methods, and obstacles to enhancing the role of pharmacists in providing patient care services and engaging in Collaborative Practice Agreements (CPAs). The committee recognized that extensive access to patient care services provided by pharmacists is constrained by scope of practice legislation, state pharmacy boards, medical restrictions, and reimbursement obstacles. The consortium offered measures to enhance pharmacists' patient care services via team-based care and collaborative practice agreements (CPAs), acknowledging that they may address some deficiencies in health care. The Centers for Disease Control and Prevention, in collaboration with the American Pharmacists Association Foundation, created a toolbox for establishing physician-pharmacist Collaborative Practice Agreements (CPAs).[56]

In 2012, The Centers for Medicare & Medicaid Services broadened the definition of medical personnel, allowing hospitals to include pharmacists as qualified candidates with privileges to operate inside the hospital, in compliance with state law. The regulation permits

practitioners in jurisdictions permitting pharmacists to engage in Collaborative Practice Agreements (CPAs) to have more participation in patient care. Consequently, pharmacists will participate in the credentialing or privileging procedure mandated by the workplace.[57] These CPAs may serve to provide specialized services for patients with CVD, including anticoagulant modification and monitoring, insulin management, and smoking cessation, among other possible uses that might enhance a cardiology practice.

5. Advocacy and Public Health

The public health function of the clinical pharmacist has been progressing as clinical practice possibilities have broadened. Beginning with the Department of Health and Human Services' "Healthy People" efforts and progressing to the ongoing "Million Hearts" Initiative aimed at preventing 1 million heart attacks and strokes by 2017, pharmacists have been recognized for their potential contributions to these national campaigns. Pharmacists have a distinctive role in community-oriented public health efforts owing to the extensive presence of local pharmacies, which facilitate accessible patient treatment. Despite the effectiveness of evidence-based pharmacological interventions and governmental educational initiatives in decreasing cardiovascular mortality over the last several decades, significant efforts are still required. The Million Hearts campaign reported that baseline aspirin use among high-risk patients is just 47%, blood pressure management is at 46%, cholesterol regulation is at 33%, and smoking cessation is at 23%, all far below their therapeutic objectives of 70%. Pharmacist involvement in the campaign via chain pharmacy firms has mostly focused on improved cardiovascular risk assessment and training initiatives.[59]

The precise impact of pharmacists on the Million Hearts campaign remains unclear; nonetheless, the delivery of Clinical Pharmacy Services (CPS) seems to be a shared characteristic across several high-performing institutions involved in the program.[60] These tasks may include direct administration of patient blood pressure to achieve treatment objectives, monitoring and promoting medication adherence, providing illness and medication education for patients, and offering assistance to medical personnel. Pharmacists play a crucial role in registry or payor-directed initiatives aimed at systematically enhancing quality via better prescription use and optimization, exemplified by the Joint Commission Core Measures. Hospitals that employed clinical pharmacists certified in cardiology had superior performance in cardiovascular medication-related core metrics.[61]

Pharmacists, including both clinical and general practitioners, contribute significantly to public disease prevention and health promotion via education, preventative health screenings, and quality assurance. Patient education about cardiac risk factors, strategies for risk factor management, and dietary and exercise practices leads to a decrease in cardiovascular events and fosters healthy lifestyles, including enhanced medication adherence. Numerous demonstration projects and novel practice environments involving pharmacists have had advantageous results. The Asheville Project was particularly significant, since pharmacist-led education and monitoring improved long-term health outcomes, including hemoglobin A1c and serum cholesterol levels, while simultaneously decreasing healthcare expenses.[65] Ramalho de Oliveira et al. (64) assessed a decade of pharmacy drug treatment management initiatives within a substantial health system. In addition to cost savings and improved health outcomes, patient satisfaction levels were elevated.

Pharmacists targeting patients with elevated cardiac risk via the deployment of quality assurance systems, disease-state management drug treatment guidelines, and health outcomes research positively affects outcomes and reduces the probability of medication mistakes. Upon diagnosis, pharmacists may facilitate chronic illness care, namely via drug education and the optimization of therapeutic regimens for the respective condition.

6. Consequences for Medical Practices

The potential for clinical pharmacy services in ambulatory or hospital-based practices is extensive, since the optimization of medication use necessitates a comprehensive assessment of every facet of the drug-use continuum. At a minimum, the presence of a clinical pharmacist as a consultant to assess medication protocols and guidelines, propose recommendations for individualized patient care through prospective or retrospective evaluations based on pharmacological principles, and deliver medication education to patients and healthcare practitioners at all levels would substantially enhance a medical practice. As medication-related transitional care emerges as a key objective for accountable care organizations and other healthcare quality entities, clinical pharmacists may assume a more significant role in ensuring the safe execution of medication transitions, either as direct participants or by overseeing and evaluating medication transitional care processes. Furthermore, a significant portion of intricate medication management (e.g., pharmacological treatment of hypertension, diabetes, dyslipidemia, and anticoagulation) may be directly assigned to a clinical pharmacist via Collaborative Practice Agreements (CPAs) under the oversight of a healthcare practitioner or medical practice, thereby enhancing efficiency for physicians and other providers in patient care. The insights offered by Ripley et al.[52] and the ACCP serve as a good guide for those seeking to apply CPAs in a medical practice.[52,66] Pharmacists may significantly enhance medication adherence among at-risk patients via direct consultation or other medication education initiatives.

Despite the many advantages of employing clinical pharmacists, the extensive implementation of this care model is hindered by the absence of a reliable direct

payment mechanism for these services. Pharmacists are now unrecognized as providers under the Social Security Act or by the Centers for Medicare & Medicaid Services, resulting in their remuneration being limited to the lowest reimbursement code (i.e., level 1 or 99211) in most clinical environments, or receiving no compensation for their actions. The Social Security Act serves as the benchmark for contemporary and developing delivery systems and payment models; hence, it is essential for pharmacists to be included in the Social Security Act with other providers. Pharmacists may use incident-to-billing for increased compensation, contingent upon the medical practice possessing the necessary infrastructure to facilitate this strategy. The extensive breadth and complexity of patient care need that pharmacists allocate sufficient and flexible time for each visit, hence rendering patient volume an inadequate strategy for producing sustainable revenue under the existing payment paradigm.

Enhanced support from the medical community and legislative reforms are necessary to provide a sustainable framework for integrating clinical pharmacists into a team-based care approach. The United States in 2011. The Surgeon General's Report advocates for health care reform that endorses pharmacists in delivering enhanced patient care services to improve patient and health system outcomes.[26] Based on the documented advantages of pharmacist-delivered care across various health care environments, the report advises health care leaders and policymakers to enhance pharmacists' roles in providing patient-centered care and disease prevention services in conjunction with physicians or as integral members of a health care team. The paper acknowledges that the growth of pharmacist services is often hindered by regulatory, legislative, and compensation obstacles; it advocates for the recognition of pharmacists as providers and the provision of suitable pay for their services.

Numerous legislative initiatives have been introduced, including measures submitted in the previous two Congresses aimed at granting Medicare patients in medically disadvantaged areas access to pharmacist-delivered ambulatory treatments under Medicare Part B.[67] A projected Medicare initiative to provide distinct compensation for chronic care management, allowing physicians to furthermore charge for the oversight of clinical personnel, may present an alternative avenue for the engagement of clinical pharmacists.[68] As "population health" reimbursement models, including bundled payments and accountable care organizations, gain prominence, direct fee-for-service reimbursement may diminish in significance, as the financial incentives to deliver optimal care while minimizing preventable harm become more aligned. Alignment based on quality incentives may be promoted via interdisciplinary organizational engagement. Examples include the ACC Surviving MI program, which emphasizes the role of pharmacists in the management of myocardial infarction patients, and the Hospital to Home (H2H) Mind Your Meds program, which prioritizes precise medication reconciliation as a critical success metric.

7. CONCLUSIONS

Clinical pharmacists, due to their specialized training and emphasis on drug management, are poised to play a crucial role within the cardiovascular care team for patients. Clinical pharmacists actively involved in medical practices significantly enhance care by optimizing medication usage and preventing avoidable adverse drug events. The ACC promotes team-based care that incorporates clinical pharmacists to "transform care, enhance heart health, and address future demands." Nonetheless, the integration of pharmacists in existing care delivery models is constrained, as they are not acknowledged as providers and lack eligibility for reimbursement under Medicare Part B. With more comprehensive legislation, pharmacists could further expand their roles to meet demands, decrease medication-related expenses, and elevate the quality of care for cardiac patients within a dynamic healthcare system. Multidisciplinary groups, such as the ACC, need to advocate for the removal of regulatory and compensation obstacles to facilitate the inclusion of pharmacists in healthcare delivery models, so enabling them to fully use their expertise and skills to offer high-quality patient care.

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دور خدمات المختبرات السريرية المتكاملة في الكشف المبكر عن الأمراض: مراجعة نهج تعاوني

الملخص

الخلفية :إن الزيادة المستمرة في انتشار الأمراض القلبية والنقص في عدد أطباء القلب تتطلب استراتيجيات صحية مبتكرة. تلعب خدمات الصيدلة السريرية التعاونية (CPS) دورًا حيويًا في تحسين نتائج المرضى من خلال دمج الصيادلة السريريين في فريق رعاية القلب والأوعية الدموية.

الطرق :تقوم هذه المراجعة بتقييم الأدبيات الموجودة حول تنفيذ خدمات الصيدلة السريرية ضمن إعدادات الرعاية الصحية متعددة التخصصات. قمنا بتحليل الدراسات التي تركز على أدوار الصيادلة السريريين في إدارة الأدوية، وتعليم المرضى، والامتثال للعلاجات المستندة إلى الأدلة. تم تلخيص البيانات من التجارب العشوائية المحكمة، والتحليلات التلوية، والدراسات الرصدية لتقييم تأثير خدمات الصيدلة السريرية على رعاية المرضى المصابين بأمراض القلب والأوعية الدموية.

النتائج :تشير النتائج إلى أن دمج الصيادلة السريريين يحسن بشكل كبير من الامتثال للأدوية، ويقلل من الأحداث الضارة المرتبطة بالأدوية، ويعزز بشكل عام نتائج المرضى في إدارة الأمراض القلبية. أدت مشاركة الصيادلة النشطة في جولات المرضى، وإجراء مراجعات للأدوية، وتقديم التعليم إلى انخفاض ملحوظ في معدلات دخول المستشفى وتحسين إدارة عوامل الخطر القلبية. على وجه الخصوص، أظهرت التدخلات التي يقودها الصيدلي تحسينات كبيرة في معدلات الامتثال للأدوية، حيث أفادت الدراسات بزيادة في الامتثال تجاوزت 15.%

الخلاصة :تعتبر خدمات الصيدلة السريرية التعاونية ضرورية في تحسين رعاية القلب والأوعية الدموية من خلال ضمان استخدام الأدوية بشكل آمن وفعال. يمكن أن يساعد دمج الصيادلة السريريين في فرق الرعاية الصحية في معالجة الثغرات في إدارة المرضى، وتحسين النتائج الصحية، وتقليل تكاليف الرعاية الصحية. يجب أن تعطي نماذج الرعاية الصحية المستقبلية الأولوية لدمج الصيادلة السريريين لتعزيز رعاية المرضى المرتكزة على المريض في ممارسات القلب والأوعية الدموية.

الكلمات المفتاحية :خدمات الصيدلة السريرية، رعاية القلب والأوعية الدموية، إدارة الأدوية، تعليم المرضى، تكامل الرعاية الصحية .