Review Article

Role of Clinical Pharmacists in Heart Failure Management: Improving Therapeutic Outcomes and Patient Care

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ABSTRACT

Heart failure (HF) is a progressive cardiovascular syndrome associated with substantial morbidity, mortality, recurrent hospitalization, polypharmacy, and healthcare utilization. Contemporary HF therapy has become increasingly complex with the widespread use of guideline-directed medical therapy (GDMT), including angiotensin receptor–neprilysin inhibitors, evidence-based beta blockers, mineralocorticoid receptor antagonists, and sodium-glucose cotransporter-2 inhibitors. Although these therapies improve outcomes, implementation in routine practice is frequently limited by suboptimal prescribing, inadequate titration, adverse drug reactions, medication discrepancies, and poor adherence. Clinical pharmacists can address these medication-related challenges through structured medication therapy management, reconciliation, patient education, adherence support, therapeutic monitoring, pharmacovigilance, and participation in multidisciplinary care. Pharmacist-led interventions have been associated with improvements in medication safety, adherence, GDMT optimization, readmission outcomes, and patient-reported quality of life, although the magnitude of benefit varies according to intervention design and healthcare setting. Emerging approaches such as telepharmacy, digital clinical decision support, artificial intelligence, and pharmacogenomics may further extend pharmacist involvement. This review discusses the current role of clinical pharmacists in HF management, evidence for clinical and patient-centred outcomes, barriers to implementation, and potential future directions.

Key words: Heart Failure, Clinical Pharmacist, Pharmaceutical Care, Medication Therapy Management, Guideline-Directed Medical Therapy, Medication Adherence, Pharmacovigilance, Telepharmacy

Heart failure is a clinical syndrome caused by structural or functional cardiac abnormalities that impair ventricular filling or ejection and produce characteristic symptoms and signs such as dyspnoea, fatigue, and peripheral oedema. It remains an important cause of morbidity, hospitalization, and mortality worldwide. The global burden is substantial, with more than 64 million people estimated to be living with HF, while the burden in Asian populations is increasing alongside hypertension, ischaemic heart disease, diabetes mellitus, rheumatic valvular disease, and cardiomyopathies [1,2]. Mortality after diagnosis remains considerable, emphasizing the need for early diagnosis, evidence-based treatment, and effective long-term disease management [3].

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Therapeutic management has changed substantially with the development of therapies that modify disease progression and reduce cardiovascular events. For patients with heart failure with reduced ejection fraction (HFrEF), contemporary treatment is built around four principal pharmacological classes: angiotensin receptor–neprilysin inhibitors (ARNIs), evidence-based beta blockers, mineralocorticoid receptor antagonists (MRAs), and sodium-glucose cotransporter-2 (SGLT2) inhibitors [4,5]. However, evidence-based treatment does not automatically translate into effective care. Registry data have shown gaps in the initiation, dosing, and persistence of recommended therapies [6]. Patients also commonly experience polypharmacy, drug interactions, medication discrepancies, adverse drug reactions (ADRs), and difficulties with adherence, all of which can compromise treatment and contribute to preventable deterioratio [7].

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Clinical pharmacists are medication specialists whose role can extend beyond dispensing to direct patient care and collaborative therapeutic decision-making. Within an HF team, pharmacists can identify drug-related problems, reconcile medicines during transitions of care, support rapid and safe GDMT optimization, monitor laboratory and clinical parameters, educate patients, and promote adherence. Their contribution is particularly relevant because HF treatment requires repeated dose adjustments in response to blood pressure, renal function, electrolyte status, symptoms, volume status, and tolerability. This review summarizes the role of clinical pharmacists throughout the HF care pathway, examines evidence concerning pharmacist-led interventions and patient outcomes, considers barriers to implementation, and discusses emerging opportunities for technology-enabled and personalized pharmaceutical care.

2. HEART FAILURE: CLASSIFICATION, BURDEN AND THERAPEUTIC CHALLENGES

HF is classified according to left ventricular ejection fraction (LVEF). The major categories are HFrEF, generally defined as LVEF below 40%; HF with mildly reduced ejection fraction (HFmrEF), with LVEF 40–49%; and HF with preserved ejection fraction (HFpEF), with LVEF of 50% or greater [8]. Functional limitation may also be described using the New York Heart Association (NYHA) classification, which ranges from no limitation of ordinary activity to symptoms at rest [9]. These classifications help guide treatment and provide a common framework for monitoring disease severity.

HF is particularly challenging because it is usually accompanied by multiple comorbidities and requires long-term pharmacotherapy. Patients may simultaneously receive medicines for hypertension, diabetes, coronary artery disease, atrial fibrillation, chronic kidney disease, dyslipidaemia, and other conditions. The resulting regimen can contain numerous medicines, increasing the risk of inappropriate prescribing, interactions, dosing errors, and non-adherence. Rehospitalization is also common after an HF admission, making the transition from hospital to home a particularly important period for medication review and patient education [7,10]. The pathophysiology of HF involves haemodynamic, neurohormonal, and structural changes. Reduced cardiac output activates the renin–angiotensin–aldosterone system and sympathetic nervous system. Persistent activation contributes to vasoconstriction, sodium and water retention, ventricular remodelling, fibrosis, and progressive cardiac dysfunction [11,12]. Modern pharmacotherapy therefore targets several complementary pathways. Pharmacists need to understand these mechanisms because treatment frequently requires balancing therapeutic benefit against hypotension, renal dysfunction, electrolyte abnormalities, volume depletion, bradycardia, and other adverse effects.

3. CONTEMPORARY PHARMACOTHERAPY AND THE NEED FOR MEDICATION OPTIMIZATION

The four foundational GDMT classes for HFrEF provide complementary mechanisms of disease modification. ARNIs inhibit neprilysin while blocking angiotensin II signalling. Evidence from PARADIGM-HF established the clinical benefit of sacubitril/valsartan compared with enalapril in appropriately selected patients [13]. When an ACE inhibitor is replaced by sacubitril/valsartan, an appropriate washout interval is required because of the risk of angioedema. Blood pressure, renal function, and serum potassium require monitoring.

Evidence-based beta blockers such as carvedilol, bisoprolol, and metoprolol succinate reduce sympathetic activation and improve outcomes when introduced and titrated appropriately. MRAs such as spironolactone and eplerenone provide additional neurohormonal blockade but require monitoring for hyperkalaemia and renal impairment. SGLT2 inhibitors have expanded the pharmacological options for HF because their benefits extend beyond glucose lowering. Dapagliflozin reduced the risk of worsening HF or cardiovascular death in HFrEF irrespective of diabetes status in DAPA-HF, while empagliflozin reduced HF-related events in EMPEROR-Reduced [14,15]. Empagliflozin subsequently demonstrated benefit in HFpEF in EMPEROR-Preserved, supporting the role of SGLT2 inhibition across a broader HF population [16].

Loop diuretics remain important for relief of congestion and symptom control, although their principal role differs from that of disease-modifying GDMT. Effective use requires assessment of weight, oedema, dyspnoea, renal function, and electrolytes. Other medicines may worsen HF or complicate its management. Non-steroidal anti-inflammatory drugs, certain antidiabetic agents, and selected cardiovascular drugs can be inappropriate in specific HF settings and should therefore be reviewed systematically [17].

The pharmacist's role is not to replace the prescribing clinician but to support safe and timely implementation of evidence-based therapy. Medication optimization includes confirming indication, identifying contraindications, reviewing doses, monitoring laboratory values, assessing adherence, detecting interactions, and communicating recommended changes to the treating team. This structured approach is especially valuable when patients transition between inpatient and outpatient care (Table 1).

4. ROLE OF CLINICAL PHARMACISTS IN HEART FAILURE MANAGEMENT

4.1 Medication Therapy Management

Medication therapy management (MTM) provides a structured process for reviewing the complete medication regimen and resolving drug-related problems. In HF, the pharmacist assesses

Table 1. Major pharmacological classes used in heart failure and pharmacist responsibilities

Drug class	Examples	Major role	Key pharmacist considerations
ACE inhibitors	Enalapril, ramipril, lisinopril	HFrEF; selected patients	Blood pressure, renal function, potassium; cough and angioedema
ARBs	Losartan, valsartan, candesartan	HFrEF when appropriate	Renal function, potassium, blood pressure
ARNI	Sacubitril/valsartan	HFrEF; guideline-directed therapy	ACE inhibitor washout, blood pressure, renal function, potassium
Beta blockers	Carvedilol, bisoprolol, metoprolol succinate	HFrEF; outcome improvement	Slow titration; heart rate, blood pressure, symptoms
MRAs	Spironolactone, eplerenone	HFrEF; outcome improvement	Potassium and renal function; interaction review
SGLT2 inhibitors	Dapagliflozin, empagliflozin	HFrEF and HFpEF	Volume status, renal function, genital/urinary adverse effects, sick-day education
Loop diuretics	Furosemide, torsemide	Congestion and symptom relief	Weight, fluid status, electrolytes, renal function

whether each medicine has an appropriate indication, whether its dose and schedule are suitable, whether treatment goals are being achieved, and whether safety concerns or interactions are present [18]. The review should include prescription medicines, over-the-counter products, and complementary or herbal preparations when relevant.

A major component is identifying opportunities for GDMT initiation and optimization. Pharmacists can review whether eligible patients are receiving the recommended classes and whether doses can be increased according to clinical status and monitoring results. This process may require repeated contacts rather than a single medication review. For example, after initiation of an RAAS-directed medicine or MRA, potassium and renal function may need reassessment; after beta-blocker adjustment, heart rate, blood pressure, symptoms, and tolerability should be considered.

Pharmacists also identify medicines that can precipitate or aggravate HF. NSAIDs may promote sodium retention and worsen renal function, while selected drugs may have negative inotropic effects or otherwise conflict with HF management [17]. Identifying these problems allows the pharmacist to recommend alternatives or communicate concerns to the prescriber. MTM therefore combines medication selection, dose optimization, monitoring, and patient-specific assessment rather than focusing on any single medicine.

4.2 Medication Reconciliation

Medication reconciliation is particularly important at admission, transfer between care settings, and discharge. These transitions create opportunities for omission, duplication, incorrect dosing, and unintended continuation or discontinuation of therapy. Reconciliation involves obtaining the most accurate medication history, comparing it with current orders, identifying discrepancies, and ensuring that the final regimen is understood by the patient [19].

For HF patients, the process should also consider recent changes in diuretics, GDMT, anticoagulants, diabetes medicines, and other drugs that influence cardiovascular or renal status. Pharmacists can clarify why each medicine is being used and identify discrepancies that may otherwise persist after discharge. Evidence from pharmacist-led discharge interventions supports a role for reconciliation and counselling in reducing medication errors and adverse events [20].

Discharge is also an important opportunity to provide an updated medication list, explain dose changes, identify monitoring requirements, and establish follow-up. The pharmacist can communicate unresolved issues to primary care clinicians, cardiologists, nurses, and community pharmacists. Continuity across these settings reduces the risk that appropriate inpatient changes are lost after the patient returns home.

4.3 Adverse Drug Reaction Monitoring and Pharmacovigilance

HF patients are vulnerable to ADRs because of age, comorbidities, polypharmacy, altered renal function, and the use of medicines with narrow therapeutic windows. Common concerns include hyperkalaemia with RAAS inhibitors and MRAs, hypotension during multidrug therapy, renal function changes during diuretic treatment, and bradycardia with beta blockers. Digoxin requires particular attention because toxicity is influenced by renal function, electrolyte disturbances, interacting medicines, and serum concentration [21]. Clinical pharmacists can establish monitoring plans, identify early warning signs, assess suspected ADRs, recommend appropriate dose modification, and document

outcomes. Pharmacovigilance activities also provide a mechanism for reporting suspected adverse reactions to institutional or national systems. Early management of tolerability problems can prevent unnecessary discontinuation of beneficial therapy. Pharmacist involvement therefore supports both individual patient safety and broader medication-safety surveillance [22].

4.4 Patient Counselling and Self-Care Education

Successful HF management depends partly on what patients are able and willing to do outside the clinical setting. Pharmacists can provide individualized education on medication purpose, administration, adherence, adverse effects, monitoring, and warning symptoms. Education may include daily weight monitoring, appropriate dietary practices, recognition of worsening breathlessness or oedema, and instructions on when to seek medical attention [23]. The effectiveness of education depends on communication quality and patient understanding. Teach-back methods allow the pharmacist to check whether the patient can explain how and when medicines should be taken and what action should be taken if symptoms worsen. Motivational interviewing can help explore barriers to adherence without assuming that non-adherence is simply a matter of patient choice. Written schedules, pill organizers, simplified dosing, and involvement of caregivers can be useful when regimen complexity or cognitive limitations are present [24].

4.5 Improving Medication Adherence

Medication adherence is a persistent challenge in HF and is influenced by adverse effects, cost, regimen complexity, health literacy, forgetfulness, cognitive impairment, and patient beliefs. Pharmacists can identify the specific barrier before selecting an intervention. Simplifying dosing schedules, synchronizing refills, providing reminders, explaining expected benefits, and addressing concerns about adverse effects are examples of practical strategies.

Digital reminders and remote follow-up can complement face-to-face care. However, technology should support rather than replace individualized assessment. Evidence synthesized in pharmacist-led adherence interventions suggests that structured interventions can improve medication-taking behaviour and may contribute to better clinical outcomes [25]. The most useful approach is generally multimodal and repeated over time, particularly after hospitalization or medication changes.

4.6 Therapeutic Drug and Laboratory Monitoring

Pharmacists contribute to monitoring both drug concentrations and laboratory parameters. Digoxin is the clearest example of a medicine requiring concentration-aware dosing, particularly in patients with renal impairment or increased susceptibility to toxicity. Appropriate interpretation requires consideration of timing of sampling, renal function, clinical response, and interacting factors rather than relying on concentration alone [26].

Monitoring also includes serum potassium, sodium, magnesium, serum creatinine, estimated glomerular filtration rate, blood pressure, heart rate, and body weight according to the medicines and clinical situation. During aggressive diuresis, changes in renal function must be interpreted alongside volume status and clinical response. Pharmacist review can help distinguish expected physiological changes from findings requiring intervention and can facilitate timely communication with the treating team (Table 2).

Table 2. Clinical pharmacist interventions across the HF care pathway

Intervention	Primary activities	Potential patient-care contribution
Medication therapy management	Comprehensive review, DRP identification, GDMT assessment, interaction screening	Safer and more appropriate pharmacotherapy
Medication reconciliation	Admission/discharge comparison, discrepancy resolution, updated medication list	Reduced medication errors and continuity gaps
GDMT optimization	Eligibility assessment, titration support, monitoring	Improved implementation of evidence-based therapy
Patient counselling	Medicine education, teach-back, self-care and warning signs	Improved understanding and self-management
Adherence support	Barrier assessment, regimen simplification, reminders, refill support	Improved medication-taking behaviour
ADR/pharmacovigilance	Detection, assessment, documentation and reporting	Earlier management of medication-related harm
Monitoring	Renal function, electrolytes, BP, HR, weight and selected drug levels	Timely dose adjustment and safety monitoring
Telepharmacy	Remote follow-up and medication review	Continuity of care after discharge and for underserved patients

5. PHARMACIST-LED INTERVENTIONS AND CLINICAL OUTCOMES

5.1 Hospital Readmissions and Transitional Care

Reduction of avoidable readmissions is a major goal of HF management. Pharmacist-led care can influence readmission risk through several mechanisms: medication reconciliation, discharge education, early identification of treatment-related problems, adherence support, and timely follow-up. Systematic reviews of pharmacist involvement in HF care have reported reductions in readmissions in some intervention models, although results vary according to the intensity and duration of pharmacist participation [27,28]. Transitional care is particularly important because patients often leave hospital with multiple medication changes and an increased risk of recurrence. Pharmacist follow-up shortly after discharge can verify that medicines were obtained, identify adverse effects, review symptoms and weight, and communicate problems to the HF team. The benefit of such programmes is therefore likely to depend on integration with the broader care pathway rather than isolated counselling at discharge.

5.2 Medication Optimization and Clinical Outcomes

Pharmacist participation in GDMT optimization can help close the gap between guideline recommendations and treatment received in routine practice. By systematically assessing eligibility, contraindications, dosing, laboratory results, and tolerability, pharmacists can facilitate initiation and titration of evidence-based therapy. Observational evidence has associated appropriate GDMT use and persistence with improved outcomes, although causal effects attributable specifically to pharmacists should be distinguished from the effects of the medicines themselves [6,29]. The strongest interpretation of pharmacist-led optimization is therefore that pharmacists can improve implementation of proven therapies rather than independently creating the pharmacological benefit. Their contribution is particularly relevant where multiple medication changes are required over a short period and where monitoring limits the speed of titration.

5.3 Quality of Life and Patient-Centred Outcomes

HF affects physical functioning, symptoms, psychological well-being, and the ability to perform daily activities. Patient-reported measures such as the Kansas City Cardiomyopathy Questionnaire and the Minnesota Living with Heart Failure Questionnaire provide structured ways to assess these dimensions [30,31]. Pharmacist interventions may influence quality of life indirectly through improved symptom control, adherence, medication safety, and self-care.

Patient-centred outcomes should therefore be considered alongside hospitalization and mortality. A successful medication-management programme should help patients understand their regimen and manage it safely at home. This is particularly important for chronic HF, where treatment effectiveness depends on sustained implementation over months and years.

5.4 Healthcare Utilization and Economic Considerations

Pharmacist involvement may influence healthcare utilization by preventing medication-related problems, reducing avoidable hospitalizations, and improving continuity after discharge. Earlier studies of integrated pharmacist-HF programmes reported reductions in HF events and healthcare use, supporting the potential economic value of pharmacist participation [30]. However, economic findings are context-dependent because costs, pharmacist staffing models, reimbursement systems, and healthcare utilization patterns differ between countries and institutions. Economic evaluation should therefore consider both programme costs and measurable outcomes such as readmissions, emergency visits, length of stay, medication errors, and patient-reported outcomes. Standardized reporting would make comparisons between pharmacist-led programmes more meaningful (Table 3).

Table 3. Examples of evidence relevant to pharmacist-supported HF care

Evidence source	Design/type	Focus	Main relevance to pharmacy practice
Koshman et al. [27]	Systematic review of randomized trials	Pharmacist care in HF	Supports pharmacist involvement in medication-focused HF care
Feltner et al. [28]	Systematic review	Transitional care	Supports structured post-discharge strategies
Savarese et al. [29]	Registry/observational evidence	HF drug titration and outcomes	Highlights importance of appropriate GDMT use and persistence
McMurray et al. [14]	Randomized controlled trial	Dapagliflozin in HFrEF	Supports SGLT2 inhibitor implementation
Packer et al. [15]	Randomized controlled trial	Empagliflozin in HFrEF	Supports SGLT2 inhibitor implementation
Anker et al. [16]	Randomized controlled trial	Empagliflozin in HFpEF	Extends evidence for SGLT2 inhibition
Gattis et al. [30]	Clinical intervention study	Clinical pharmacist integrated into HF team	Provides evidence for integrated pharmacist care
Schichtel et al. [35]	Practice/impact analysis	Pharmacist-led GDMT	Illustrates pharmacist participation in guideline-directed therapy

6. INTEGRATION OF CLINICAL PHARMACISTS INTO MULTIDISCIPLINARY HF CARE

Current HF care is multidisciplinary because no single professional can address all therapeutic, behavioural, nutritional, functional, and social needs. Cardiologists, physicians, nurses, pharmacists, dietitians, physiotherapists, social workers, and other professionals may contribute according to the patient's needs [33]. Within this structure, the clinical pharmacist provides medication-focused expertise and connects pharmacological decisions with monitoring and patient education. Participation in ward rounds, HF clinics, case conferences, and discharge planning allows pharmacists to identify problems early. Collaborative practice arrangements may permit pharmacists to make defined medication adjustments under agreed protocols and clinical supervision. Such models can support more frequent monitoring and titration while maintaining communication with the cardiology team. Evidence from integrated care programmes suggests that pharmacist participation can improve medication management and may be delivered efficiently when roles, referral pathways, documentation standards, and escalation procedures are clearly defined [31].

Successful integration requires institutional recognition of the pharmacist as a clinical care professional. Clear responsibilities should be established for medication review, reconciliation, monitoring, education, documentation, follow-up, and communication. Outcome measures should be selected before implementation so that programmes can demonstrate their contribution to patient care.

7. CHALLENGES AND LIMITATIONS

Despite the potential value of clinical pharmacy services, implementation remains uneven. In many settings, pharmacists continue to be concentrated in dispensing and supply functions, leaving limited staffing for direct patient care. Workforce shortages may be especially relevant in resource-constrained health systems, including parts of India [35,36].

Scope-of-practice regulations also differ between jurisdictions. Where pharmacists cannot independently modify therapy or where collaborative agreements are not established, their recommendations may require additional authorization, potentially delaying medication changes. This does not necessarily limit the clinical value of pharmacists, but it can affect how efficiently their expertise is incorporated into treatment decisions. Workload and documentation requirements are additional barriers. Comprehensive medication review, counselling, laboratory monitoring, follow-up, and communication require time. Institutions may also lack standardized indicators with which to demonstrate the clinical and economic contribution of pharmacy services. Development of agreed performance measures, such as medication discrepancies resolved, GDMT optimization, ADR prevention, adherence outcomes, and readmission measures, can help evaluate service effectiveness [34]. Variation in programme design is another limitation of the evidence base. Pharmacist interventions differ in setting, duration, scope, level of prescribing authority, patient selection, and intensity of follow-up. Consequently, results from one programme should not automatically be generalized to all healthcare systems.

8. EMERGING AND FUTURE ROLES

8.1 Telepharmacy and Digital Health

Telepharmacy can extend pharmacist follow-up beyond hospital walls and may be particularly useful after discharge or for patients who have difficulty accessing specialist services. Video or telephone consultations can be used to review medicines, adherence, symptoms, adverse effects, and monitoring results. Digital communication may also facilitate rapid escalation when warning signs are identified. Reviews of pharmacist-led telehealth services have reported potential benefits in cardiovascular care, although implementation and outcome evidence remains heterogeneous [38,39].

Future models are likely to combine in-person assessment with remote follow-up rather than treating telepharmacy as a complete substitute for clinical examination. Appropriate privacy, documentation, technology access, and escalation pathways are essential.

8.2 Artificial Intelligence and Clinical Decision Support

Artificial intelligence (AI) and clinical decision-support systems may help pharmacists process large quantities of medication and clinical information. Potential applications include identifying patients at high risk of medication-related harm, detecting discrepancies in medication lists, extracting medicines from clinical notes, and supporting evidence-based medication review. Natural language processing has already been investigated for automated medication extraction from discharge documentation [36].

AI should be regarded as a decision-support tool rather than an autonomous replacement for clinical judgement. Pharmacists remain responsible for evaluating whether an alert is clinically meaningful, considering patient-specific circumstances, and communicating appropriate recommendations. Future studies should evaluate clinical validity, false-positive rates, workflow effects, transparency, and patient outcomes rather than relying solely on technical performance.

8.3 Pharmacogenomics and Personalized Medicine

Pharmacogenomics offers a potential approach to tailoring drug therapy according to genetic variation. Variants in genes affecting drug metabolism or pharmacodynamic response may

contribute to differences in response or tolerability. Pharmacists with appropriate training can contribute to interpretation of pharmacogenomic results and integration of these results with clinical factors.

However, routine pharmacogenomic use in HF requires stronger evidence demonstrating that genotype-guided decisions improve meaningful patient outcomes and are cost-effective in routine practice. Implementation also requires laboratory access, standardized interpretation, clinician education, and appropriate governance. Current evidence supports continued evaluation rather than assuming that widespread routine testing is already established [41,42].

8.4 Advanced Practice and Collaborative Pharmacist Models

Advanced pharmacist practice models provide structured opportunities for pharmacists to participate in medication initiation and titration under defined clinical protocols. Collaborative drug therapy management can be particularly useful in chronic diseases requiring frequent dose adjustments. In HF, such models may allow pharmacists to respond promptly to laboratory results, blood pressure, heart rate, symptoms, and volume status while maintaining defined communication with cardiologists.

The sustainability of these models depends on legal authority, credentialing, training, institutional support, documentation, and reimbursement. Evidence from pharmacist-led GDMT programmes suggests that appropriately structured services can improve implementation of recommended therapy [35]. Future research should compare different practice models and identify the workforce and organizational characteristics associated with durable clinical benefit.

8.5 Practical Framework for Pharmacist-Led HF Services

A practical pharmacist-led HF service should be organized around a defined sequence of assessment, intervention, monitoring, and follow-up. At the initial contact, the pharmacist should establish the patient's current medication list, indication for each medicine, adherence pattern, recent medication changes, allergy history, and relevant clinical and laboratory parameters. This assessment provides a baseline for identifying drug-related problems and prioritizing interventions.

The next step is to develop an individualized medication plan in collaboration with the HF team. The pharmacist can identify missing or suboptimally dosed evidence-based therapies, assess contraindications, recommend appropriate titration, and define the monitoring required after each change. Patient preferences, affordability, regimen complexity, health literacy, and access to follow-up should be incorporated into the plan because these factors influence whether a theoretically appropriate regimen can be sustained.

Follow-up should be structured according to clinical risk and recent treatment changes. Patients who have recently been discharged or started on multiple medicines may require earlier contact. At each follow-up, the pharmacist can reassess symptoms, adherence, adverse effects, blood pressure, heart rate, body weight, renal function, and electrolytes as appropriate. Problems should be escalated promptly to the responsible clinician or HF team. Service evaluation should use measurable indicators. Examples include the proportion of eligible patients receiving recommended GDMT classes, achievement of appropriate doses, medication discrepancies resolved, clinically significant ADRs identified, adherence-related problems addressed, and follow-up completed after discharge. Patient-reported outcomes and readmission measures can provide complementary information. This framework can be adapted to hospital, outpatient, community, and telepharmacy settings while preserving the core medication-management functions of the clinical pharmacist.

CONCLUSION

Clinical pharmacists have an important role in the multidisciplinary management of HF because medication use is central to both disease modification and symptom control. Their contributions include medication therapy management, reconciliation, GDMT optimization, ADR monitoring, pharmacovigilance, patient education, adherence support, and therapeutic and laboratory monitoring. Evidence from pharmacist-led programmes indicates potential improvements in medication safety, treatment implementation, readmission-related outcomes, and patient-centred care, although effects vary across settings and intervention designs.

The expanding complexity of HF pharmacotherapy increases the need for structured medication management. Pharmacists can help translate guideline recommendations into practical, patient-specific treatment plans while monitoring safety and supporting sustained adherence. Greater integration into HF clinics, transitional care programmes, and multidisciplinary teams may strengthen this contribution. Telepharmacy, digital decision support, pharmacogenomics, and collaborative practice models provide additional opportunities, but their implementation should be accompanied by appropriate evidence, governance, and outcome evaluation. Future development of clinical pharmacy services in HF should focus on clearly defined roles, adequate staffing, standardized outcome measures, interdisciplinary communication, and models that fit local healthcare systems. Strengthening these elements can help ensure that the pharmacological advances available for HF are implemented safely and consistently in routine patient care.

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