our website www.ejaypee.com, for detailed information on cardiology books, visit our website www.ejaypee.com

Drugs for The Heart

Editor
Suman Bhandari

Foreword
SC Manchanda

JAYPEE

Contents

1. **What is a Drug and Scope of the Book?** 1
   Suman Bhandari
2. **Drugs for Hypertension** 3
   Ankush Sachdeva
3. **Drugs for Type 2 Diabetes Mellitus** 47
   Chhavi Agrawal
4. **Drugs for Dyslipidemia** 61
   Ashwani Mehta
5. **Drugs for Smoking Cessation** 84
   Peeyush Jain
6. **Drugs for Obesity and Cardiovascular-kidney-metabolic Syndrome** 89
   Chhavi Agrawal
7. **Antiplatelets, Antithrombotics, and Thrombolytics** 105
   Shailesh Singh
8. **Drugs for Chronic Coronary Artery Disease and Acute Coronary Syndromes** 201
   Shailesh Singh
9. **Drugs in Heart Failure** 256
   Suman Bhandari, Nilashish Dey
10. **Diuretics: Current Usage Guidelines** 262
    Ajit Singh Narula, Sanjeev Gulati, Akash Gupta
11. **Antiarrhythmic Drugs** 278
    Amitesh Chakravarty, Atul Kaushik
12. **Drugs in HOCM and Other Cardiomyopathies** 287
    Amirul Haque, Suman Bhandari
13. **Drugs for Pulmonary Embolism** 299
    HS Isser, Avnish Kaur, Dikshant Jain, AH Ansari, Mehak Munjal
14. **Drugs in Pregnancy** 325
    Amirul Haque, Suman Bhandari

15. **Drugs in Infective Endocarditis** 329
Vibhav Sharma, Satyavir Yadav

16. **Drugs in Pulmonary Hypertension** 351
Sandeep Bansal, Devesh Kumar

17. **Drugs for Pediatric Cardiology** 369
Neeraj Awasthy, Touseef Ul Ayoub

18. **Drugs Used in Resuscitation/Cardiopulmonary Resuscitation and Other Crash Cart Essentials** 381
Naba Mallika Taye, Hima Chauhan, Rajat Agrawal

Index 405

9

CHAPTER

Drugs in Heart Failure

Suman Bhandari, Nilashish Dey

INTRODUCTION

The management of heart failure (HF) in 2025 has evolved significantly, integrating established pillars with newly approved and emerging therapies, all grounded in contemporary global guidelines and evidence from recent landmark trials. This comprehensive article reviews the current pharmacologic landscape for HF management, focusing on drug classes, latest indications, evidence basis, application in subtypes, optimization strategies, and emerging innovations, with clinical guidance for integration into practice.[1-4]

Heart failure remains a leading cause of morbidity, mortality, and healthcare expenditure worldwide despite therapeutic advances. The main goals of HF management are symptom relief, reduction of hospitalization, and mortality risk mitigation. For effective outcomes, modern therapy demands an evidence-based, phenotypic, and patient-tailored approach.[1,5]

FOUNDATIONS OF HEART FAILURE PHARMACOTHERAPY

Four Pillars for Heart Failure with Preserved Ejection Fraction

The contemporary management of heart failure with reduced ejection fraction (HFrEF, EF <40%) is built on four major pharmacologic pillars:[1,3,6,7]

1. Beta-blockers
2. Renin–angiotensin system (RAS) inhibitors or angiotensin receptor-neprilysin inhibitors (ARNIs)
3. Mineralocorticoid receptor antagonists (MRAs)
4. Sodium-glucose cotransporter-2 (SGLT2) inhibitors

Early and simultaneous initiation, followed by rapid up-titration, is advocated for most patients unless contraindicated. These agents are established as the backbone for reducing mortality and morbidity in HFrEF.[1,7]

JAYPEE BROTHERS

Beta-blockers

Beta-blockers (bisoprolol, carvedilol, metoprolol succinate, and nebivolol) antagonize the deleterious effects of chronic adrenergic activity in HF, leading to improved survival, reduced hospitalizations, and in improved ventricular function. They are essential unless absolute contraindications exist such as severe bradycardia, advanced AV block, or profound asthma.[1,6]

Renin–Angiotensin System Blockers and Angiotensin Receptor-neprilysin Inhibitors

Renin–angiotensin system inhibitors [angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs)] were the first blockbuster class in HF, reducing mortality and hospitalizations. However, ARNIs (sacubitril/valsartan) have surpassed ACE inhibitors in efficacy, as shown in the PARADIGM-HF trial, and are now recommended as the preferred first-line RAS-modulating agent for HFrEF, provided there are no contraindications or prior intolerance to ACE inhibitors/ARBs. ARNIs are associated with improvements in quality of life, left ventricular reverse remodeling, and N-terminal pro-B-type natriuretic peptide (NT-proBNP) reduction.[1,6,7]

Mineralocorticoid Receptor Antagonists

Mineralocorticoid receptor antagonists (spironolactone and eplerenone) provide additive mortality benefit by antagonizing aldosterone, reducing sodium retention, adverse remodeling, and arrhythmogenesis. Newer nonsteroidal MRAs such as finerenone offer similar efficacy with reduced hyperkalemia risk, though evidence in HFrEF is still evolving.[1,2]

Sodium-glucose Cotransporter-2 Inhibitors

Initially developed as glucose-lowering drugs, SGLT2 inhibitors (dapagliflozin and empagliflozin) have rapidly become mainstays in HF, showing robust efficacy in reducing HF hospitalizations and cardiovascular mortality, regardless of diabetes status. SGLT2 inhibitors exert multifactorial benefits via natriuresis, improved energetics, reduction in cardiac preload/afterload, and anti-inflammatory effects.[1,2]

JAYPEE BROTHERS

TAILORING THERAPY FOR HEART FAILURE PHENOTYPES

Heart Failure with Preserved Ejection Fraction and Mid-range Ejection Fraction

Management of heart failure with preserved ejection fraction (HFpEF, EF ≥50%) or mildly reduced EF (HFmrEF, EF 41–49%) previously lacked disease-modifying options. Recent advances have influenced practice:

- SGLT2 inhibitors are now recommended for HFpEF and HFmrEF to reduce hospitalization risk and provide modest symptom benefit.[2,5]
- MRAs and ARNIs may be considered in selected HFmrEF/HFpEF patients with significant symptoms, especially in those with higher natriuretic peptide levels or evidence of volume overload.[2,5]
- Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and antiobesity drugs are emerging options in obese HFpEF cohorts, leveraging metabolic and hemodynamic improvement.[5,8]

ACUTE DECOMPENSATED HEART FAILURE

In acute settings, intravenous diuretics remain the mainstay for rapid decongestion. Vasoactive drugs (vasodilators and inotropes) are used selectively in patients with severe congestion, low cardiac output, or hypotension.[1,6]

CURRENT RECOMMENDATIONS FROM MAJOR GUIDELINES

Initiation and Titration

- All four pillar therapies should be started as soon as tolerable in newly diagnosed HFrEF, without unnecessary delays for sequential titration.[1,3]
- Target evidence-based dosing as rapidly as possible, adjusting for blood pressure, renal function, and tolerability.[1,6]

Combination and Sequence

- ARNIs should replace ACE inhibitors/ARBs when feasible.[1,3]
- SGLT2 inhibitor should be started regardless of diabetes status and continued for all HF phenotypes unless contraindicated.[2]

JAYPEE BROTHERS

- Beta-blockers and MRAs should be initiated and up-titrated whenever possible, guided by symptoms, heart rate, and potassium/renal parameters.[1]

Adjunctive Therapies and Special Cases

- Ivabradine for persistently elevated heart rate despite maximal β-blocker
- Vericiguat (soluble guanylate cyclase stimulator) for selected high-risk patients with recent HF decompensation[1]
- Hydralazine/nitrate combination for HFrEF with intolerance or contraindication to RAS inhibitors, especially in Black patients.[6]
- Digoxin may be considered for symptom control in patients with atrial fibrillation (AF) and/or intolerance to other agents.
- Iron therapy (IV iron) for symptomatic patients with confirmed iron deficiency.[6]

Novel and Investigational Therapies

- Finerenone (nonsteroidal MRA) for selected HFrEF or HFpEF with concomitant chronic kidney disease (CKD)/diabetes.[1,2]
- *Balcinrenone:* Currently under investigation, promising renal and cardiac safety profile.
- *Cardiorenal and anti-inflammatory strategies:* Tumor necrosis factor-α (TNF-α) antagonists and interleukin-1 (IL-1) blockers remain experimental.
- Gene therapies and cell-based interventions are in early clinical trials.[1]

DEVICE-GUIDED AND INTERVENTIONAL STRATEGIES

- Pulmonary artery pressure monitoring with implantable devices (e.g., CardioMEMS) is now supported by evidence and included as a class IIb recommendation for selected patients to minimize hospitalization.[5]
- Interatrial shunt devices for HFpEF, currently under study with early positive results in selected subgroups.[5]

PRACTICAL CLINICAL CONSIDERATIONS

Up-titration Challenges

- Low blood pressure, bradycardia, hyperkalemia, and renal dysfunction often limit optimal titration.[1]

JAYPEE BROTHERS

- Individualize regimens and carefully monitor for side effects; use flexible sequencing to ensure all four pillars are established if not maximally dosed.[1]

Polypharmacy and Comorbidities

- Frequent multimorbidity (AF, hypertension, diabetes, CKD, and obesity) requires a holistic and coordinated care model.[5]
- Address reversible contributors, optimize comorbidity management, and prioritize therapies with additional benefit for these conditions.[2,5]

PATIENT-CENTERED APPROACHES

- Shared decision-making and patient education increase adherence and outcomes.
- Early initiation of palliative care should be considered in advanced HF or refractory symptoms to improve quality of life.[1,5]

LATEST GUIDELINE HIGHLIGHTS

- Initiate all four pillars as early as possible[1,3]
- Replace ACE inhibitor or ARB with ARNI if tolerated
- Start SGLT2 inhibitor universally for eligible patients regardless of diabetes status
- Use MRAs unless contraindicated
- Optimize adherence and monitoring (BP, renal, and K^+)
- Tailor strategies for HFmrEF and HFpEF based on comorbidities and drug tolerability[1,2]

SPECIAL POPULATIONS AND COMORBIDITY-SPECIFIC UPDATES

- *CKD:* SGLT2 inhibitor and finerenone may benefit both kidney and heart; monitor renal function closely.[1,2]
- *Diabetes:* SGLT2 inhibitors confer mortality benefits, and GLP-1 RAs are emerging for obese HFpEF.[8]
- *Obesity:* GLP-1 RAs and antiobesity drugs improve outcomes in obese HFpEF.[5,8]
- *Elderly and frail:* Lower initial doses and slower titration; prioritize tolerability.[5]

FUTURE DIRECTIONS

- Nonsteroidal MRAs, advanced SGLT2 inhibitors, and multimodal metabolic agents are under study.

JAYPEE BROTHERS

- Gene and cell therapies, anti-inflammatory agents, and device-based strategies could revolutionize HF care in the next decade.[1,5]

CONCLUSION

The modern management of HF is anchored on rapid, comprehensive, and individualized implementation of evidence-based drug therapies. ARNIs, SGLT2 inhibitors, MRAs, and β-blockers now comprise the essential four pillars, with robust guideline support for their use in most HFrEF and (to a significant degree) in HFpEF/HFmrEF. Novel options such as finerenone, vericiguat, and emerging antiobesity drugs further expand the armamentarium. Optimal titration, monitoring, and patient engagement remain central to achieving the best outcomes in this high-risk population.[1-3,8]

REFERENCES

1. Pandey AC, Lorusso R, Boriani G. Pharmacological Therapy of HFrEF in 2025. Eur Cardiol Rev. 2025;20(2):e16.
2. Medscape. (2025). Heart Failure Treatment & Management. [online] Available from https://emedicine.medscape.com/article/163062-treatment [Last accessed April, 2026].
3. American College of Cardiology. (2025). Focus on Heart Failure | HFpEF: Where We Stand in 2025. [online] Available from https://www.acc.org/latest-in-cardiology/articles/2025/06/01/01/focus-on-heart-failure-hfpef [Last accessed April, 2026].
4. Riccardi M, D'Elia E, Lombardi CM, Savarese G, Gori M, Oliva F, et al. Current Treatment of Heart Failure with Preserved Ejection Fraction. J Clin Med. 2025;14(15):5406.
5. Chopra V, Khan MS, Abdelhamid M, Abraham WT, Amir O, Anker SD, et al. iCARDIO Alliance Global Implementation Guidelines on Heart Failure 2025. Heart Lung Circ. 2025;34(7):e55-e82.
6. Taylor EB, Hall JE, Mouton AJ. Current anti-inflammatory strategies for treatment of heart failure: From innate to adaptive immunity. Pharmacol Res. 2025;216:107761.
7. Fine NM. Medications for Heart Failure. In: MSD Manual Professional Edition. Reviewed by Jonathan G Howlett. Reviewed/Revised Modified Oct 2025. Available from MSD Manual Professional Edition. Accessed April 2026.
8. Lin Q, Lv Z, Li D, Ling Q, Qiu S, Lei X, et al. Heart failure medication treatment and prognosis: a retrospective cross-sectional study. Front Pharmacol. 2025;16:1532123.

JAYPEE BROTHERS

for detailed information on cardiology books, visit our website www.ejaypee.com, for detailed information on cardi

Drugs for The Heart

Salient Features

- A first of its kind in Southeast Asia
- Contemporary review of Drugs for the Heart 2027
- Chapters covered by key opinion leaders/institutes of India
- An update and reference book
- A must for all cardiologists; early to peak career

Suman Bhandari MD DM FCSI FACC FSCAI FESC has over four decades of experience in cardiology. Having done his DM(Cardiology) from the All India Institute of Medical Sciences (AIIMS) in 1983, he served as a faculty at AIIMS and Sir Ganga Ram Hospital, New Delhi, India, before joining EHRC in 1988. He has done numerous Interventional Fellowships from Thorax Centre, Cleveland Clinic, Rouen (Prof Cribier), Leuven (Belgium), Toulouse (France), and Japan (Tokyo and Tokai University). He served as an Editor for Indian Heart Journal and also editorial board of the Heart (BMJ). He has served as the Vice President of National CSI and Ex-President of Delhi CSI, having over two decades of executive roles in scientific bodies. He is currently Editor-in-Chief of the Journal of Current Cardiology (JCC) from Wolters Kluwer, the official Delhi CSI Journal, and has over 200 papers in national and international journals as well as numerous book chapters. He has edited the book "Recent Advances in Cardiology" (two issues since 2023) and also the "Progress in Cardiology (volume 1)" in 2026. He runs a popular "Best Cardiac Practices" course to disseminate current knowledge.

Buy from ejaypee

JAYPEE BROTHERS

Shelving Recommendation
CARDIOLOGY

ISBN 978-93-7806-688-7