Review Article

Guideline Concordance for HFrEF Therapy in the United Arab Emirates: Retrospective Real-World Data Benchmarked Against Canadian Practice

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Abstract

Background: Contemporary heart failure with reduced ejection fraction (HFrEF) management is based on four foundational pharmacologic therapies: renin-angiotensin system inhibition, preferably with an angiotensin receptor-neprilysin inhibitor (ARNI); an evidence-based beta-blocker; a mineralocorticoid receptor antagonist (MRA); and a sodium-glucose cotransporter-2 inhibitor (SGLT2i). Real-world implementation remains variable.

Objective: To examine contemporary HFrEF pharmacotherapy in a published United Arab Emirates (UAE) retrospective cohort and benchmark medication use against Canadian real-world data and Canadian guideline recommendations.

Methods: Published retrospective UAE data from adults hospitalized with heart failure at Zayed Military Hospital during 2024 were evaluated, focusing on the HFrEF subgroup. Class-specific use of foundational HFrEF therapy was compared with a Canadian retrospective cohort from the Regina Heart Function Clinic and with Canadian population-level data.

Results: The UAE cohort included 152 patients with heart failure, of whom 87 (57.2%) had HFrEF. Among patients with HFrEF, 72/87 (82.8%) received an ACE inhibitor, angiotensin receptor blocker, or ARNI; 82/87 (94.3%) received a beta-blocker; 65/87 (74.7%) received an SGLT2 inhibitor; and 19/87 (21.8%) received an MRA. In comparison, among 129 patients attending a specialized Canadian heart-function clinic, optimized therapy was documented in 82.2% for renin-

angiotensin system inhibition, 79.1% for beta-blockers, 80.6% for MRAs, and 74.4% for SGLT2 inhibitors; 47.3% received optimized four-pillar therapy. The major difference between the UAE and Canadian cohorts was MRA utilization.

Conclusion: Contemporary UAE practice demonstrates high uptake of beta-blockers, renin-angiotensin system inhibitors, and SGLT2 inhibitors in hospitalized patients with HFrEF, but substantial underutilization of MRAs. Comparison with Canadian specialized-care data suggests that systematic medication review, documentation of contraindications, multidisciplinary care, and structured post-discharge optimization may improve four-pillar GDMT implementation.

Keywords: heart failure; HFrEF; guideline-directed medical therapy; United Arab Emirates; Canada; clinical audit; guideline concordance

1. Introduction

Heart failure with reduced ejection fraction remains associated with recurrent hospitalization, impaired quality of life, and premature mortality. Major advances in pharmacotherapy have shifted HFrEF management from sequential addition of medications toward early implementation of multiple therapies with complementary mechanisms. The Canadian Cardiovascular Society and Canadian Heart Failure Society recommend four foundational therapies for eligible patients with HFrEF: ARNI, or ACE inhibitor/ARB when appropriate; an evidence-based beta-blocker; an MRA; and an SGLT2 inhibitor.[1] Treatment should be individualized according to blood pressure, renal function, potassium, tolerability, adherence, and patient preference. Despite strong evidence, implementation in routine practice remains incomplete. Examining differences between health systems may help identify modifiable barriers.

Recent UAE data provide an opportunity to evaluate real-world prescribing in hospitalized patients and compare practice with Canadian experience.

2. UAE Retrospective Cohort

Jumani and colleagues retrospectively reviewed all consecutive adults admitted with a primary diagnosis of heart failure at Zayed Military Hospital, UAE, between January and December 2024.[2] A total of 152 patients were included:

- 105 (69%) were male;
- mean age was 68.5 years;
- 87 (57.2%) had HFrEF;
- 36 (23.7%) had mildly reduced EF; and
- 29 (19.1%) had preserved EF.

Among patients with HFrEF, mean age was 66.3 years and 69/87 (79.3%) were male. Ischemic heart disease was present in 51/87 (58.6%), diabetes in 54/87 (62.1%), chronic kidney disease in 23/87 (26.4%), hypertension in 68/87 (78.2%), and atrial fibrillation in 31/87 (35.6%).[2] The cohort therefore represented a clinically complex population with substantial cardiovascular and metabolic comorbidity.

3. Guideline-Directed Therapy in the UAE

Foundational therapy	**UAE HFrEF cohort**
ACEI/ARB/ARNI	72/87 (82.8%)
Evidence-based beta-blocker	82/87 (94.3%)
MRA	19/87 (21.8%)
SGLT2 inhibitor	65/87 (74.7%)

Medication use among the 87 patients with HFrEF was: Use of three of the four foundational medication classes was relatively high. Beta-blocker use exceeded 90%, and approximately three-quarters of patients received an SGLT2 inhibitor. The most striking treatment gap was MRA therapy, which was prescribed in only 21.8% of HFrEF patients.[2]

The published UAE report did not provide the proportion of patients simultaneously receiving all four classes, nor did it systematically report achievement of target or maximally tolerated doses. An overall four-pillar concordance percentage therefore cannot be reliably calculated from the published data. This distinction is important because medication alone does not necessarily indicate optimized GDMT.

4. Comparison With Canadian Specialized Care

McVannel and colleagues evaluated 129 patients with HFrEF attending the Regina Heart Function Clinic in Saskatchewan.[3] Optimized therapy was documented in:

- renin-angiotensin system inhibition: 106/129 (82.2%);
- beta-blocker: 102/129 (79.1%);
- MRA: 104/129 (80.6%); and
- SGLT2 inhibitor: 96/129 (74.4%).

Overall, 61/129 patients (47.3%) were considered to be receiving optimized four-pillar GDMT.[3]

A direct numerical comparison should be interpreted cautiously. The Canadian study assessed optimized therapy, incorporating target or maximally tolerated treatment and documented reasons limiting therapy, whereas the UAE study primarily reported whether a medication was prescribed.

Nevertheless, the comparison is informative. Renin-angiotensin system inhibitor use was remarkably similar: 82.8% in the UAE versus 82.2% in the Canadian cohort. SGLT2 inhibitor use was also almost identical: 74.7% versus 74.4%. Beta-blocker use was numerically higher in the UAE hospitalized cohort: 94.3% versus 79.1% optimized therapy in Canada. The major difference was MRA therapy: 21.8% in the UAE compared with 80.6% optimized therapy in the Regina clinic.

5. The MRA Treatment Gap

The marked difference in MRA use deserves particular attention. Potential barriers include:

- impaired renal function;
- hyperkalemia;
- concerns regarding worsening kidney function;
- inadequate laboratory follow-up;
- hypotension;
- previous intolerance;
- therapeutic inertia; and
- lack of systematic assessment before discharge.

In the UAE HFrEF cohort, 26.4% had chronic kidney disease.[2] However, the published study did not provide patient-level reasons for MRA non-prescription. It is therefore not possible to determine how much of the 78.2% non-use represented appropriate contraindication versus an opportunity for treatment optimization. This illustrates why future clinical audits should evaluate eligibility-adjusted concordance, rather than simply reporting medication use. For each medication omitted, the audit should determine whether there was:

1. an absolute or relative contraindication;
2. documented intolerance;
3. a temporary clinical reason for withholding therapy;
4. a documented plan to reconsider treatment; or
5. no identifiable reason.

6. Lessons From Canadian Practice

Canadian data suggest that specialized multidisciplinary heart-failure management can improve GDMT implementation. In the Regina study, pharmacists documented 553 additional patient-care activities outside scheduled multidisciplinary visits, involving 76 of 129 patients.[3] This illustrates the intensity of medication management that may be required to achieve high levels of guideline concordance.

A larger Canadian population-based study involving 66,372 adults aged ≥65 years with HFrEF demonstrated substantially poorer treatment optimization outside specialized heart-failure settings.[4] Within six months after hospitalization:

- 7.2% received no foundational therapy assessed in that era;
- 25.9% received monotherapy;
- 46.6% received dual therapy; and
- only 20.4% received triple therapy.

Only 8.3% were receiving therapy meeting the study's definition of optimal treatment at their last evaluated dose.[4] Although this Canadian study preceded widespread incorporation of SGLT2 inhibitors into four-pillar therapy, it demonstrates that treatment gaps are not unique to the UAE.

7. Role of Physician Specialty and Care Model

The UAE study also reported that patients managed under cardiology had greater GDMT uptake than those treated under internal medicine or intensive care services.[2] Of the full cohort, 89 patients were admitted under cardiology, 57 under internal medicine, and 6 under intensive care. The finding should not be interpreted simply as a difference in individual physician performance. Specialized cardiology services are more likely to have structured heart-failure pathways, familiarity with rapid GDMT sequencing, access to heart-failure clinics, and mechanisms for laboratory and post-discharge follow-up. A more useful quality-improvement question is therefore: What processes used in specialized heart-failure care can be incorporated into internal medicine and family medicine practice?

8. Proposed Audit Standard for UAE Hospitals

A contemporary audit should assess every HFrEF patient against the following four questions:

1. Is the patient receiving ARNI/ACEI/ARB? If not, is there a documented reason?

2. Is the patient receiving an evidence-based beta-blocker?
If not, is there bradycardia, hypotension, decompensation, or another documented reason?

3. Is the patient receiving an MRA? If not, are potassium, renal function, blood pressure, or intolerance documented as barriers?

4. Is the patient receiving an SGLT2 inhibitor? If not, is there a contraindication, intolerance, access problem, or planned reassessment?

The optimal quality target should not simply be 100% prescribing. A more appropriate target is: 100% of eligible patients should have all four foundational therapies systematically assessed, with treatment prescribed when appropriate or a documented clinical reason for non-prescription.

9. Conclusion

Contemporary UAE data demonstrate encouraging implementation of several components of HFrEF GDMT. Among 87 hospitalized UAE patients with HFrEF, 82.8% received renin-angiotensin system inhibition, 94.3% beta-blockers, and 74.7% SGLT2 inhibitors. However, only 21.8% received an MRA. Canadian specialized-care data demonstrate similar use of renin-angiotensin system inhibitors and SGLT2 inhibitors but substantially greater MRA optimization. The most important opportunity identified by this comparison is therefore not simply greater medication prescribing, but development of structured systems ensuring that every eligible patient undergoes systematic four-pillar review. Integration of cardiologists, internists, family physicians, clinical pharmacists, nursing, laboratory monitoring, and structured post-discharge follow-up could help translate guideline recommendations into sustained real-world treatment.

Declarations

Ethics Approval: Not applicable. This study did not involve human participants, animal experimentation, or confidential patient clinical data. All data was collected retrospectively from patients' charts. No patient data was used or published in this study.

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