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Global Convergence and Divergence in Clinical Practice Guidelines for Heart Failure With Preserved Ejection Fraction: A Systematic Comparative Review

Caleb C. Dunkwu ^{1, 2}, Isha Bashir ³, Emmanuel Erhieyovwe ^{4, 5}, Oghenekome S. Aghale ⁶

1. Diabetes and Endocrinology, NHS Tayside, Dundee, GBR 2. Diabetes, Endocrinology, and Reproductive Biology, University of Dundee, Dundee, GBR 3. Medicine, Calderdale and Huddersfield NHS Foundation Trust, Huddersfield, GBR 4. Medicine, East Lancashire Hospitals NHS Trust, Blackburn, GBR 5. Research and Innovation, School of Medicine and Dentistry, University of Lancashire, Preston, GBR 6. Internal Medicine, Delta State University, Abiraka, NG

Corresponding author: Caleb C. Dunkwu, dunkwucaleb@gmail.com

Abstract

Heart failure with preserved ejection fraction (HFpEF) is a growing global health challenge, yet international clinical guidance remains heterogeneous. This review synthesizes HFpEF recommendations from major national and international guidelines published between 2014 and March 2026.

A systematic, PRISMA-informed search of bibliographic databases, guideline repositories, and professional society websites identified 1,061 records. Following deduplication and two-stage screening, 15 distinct documents met the eligibility criteria, spanning Europe, North America, South America, Asia, and Oceania. Data were extracted on diagnostic criteria, natriuretic peptide thresholds, scoring systems, pharmacological and nonpharmacological management, comorbidity strategies, and follow-up recommendations. Methodological quality was appraised using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument, and findings were synthesized narratively. Regional endorsement and adaptation frameworks, specifically those from the Pan-African Society of Cardiology (PASCAR), were integrated via qualitative synthesis.

There was strong global consensus on the core diagnostic definition of HFpEF, the role of natriuretic peptides and echocardiography, the use of diuretics for congestion, and sodium-glucose cotransporter 2 (SGLT2) inhibitors as foundational disease-modifying therapy. Variation persisted in diagnostic scoring systems (HFA-PEFF vs. H2FPEF vs. none), natriuretic peptide thresholds (particularly those recommended by the National Institute for Health and Care Excellence (NICE)), use of advanced diagnostic testing, and phenotype-specific recommendations. The 2023 Saudi Heart Association update strengthened representation from the Middle East, with regional emphasis on diabetes, obesity, and metabolic syndrome. No sub-Saharan African guideline was identified; the PASCAR provides capacity-building frameworks rather than formal recommendation-based guidance.

This review provides a comprehensive comparative analysis of contemporary HFpEF guidelines. Findings highlight increasing international convergence, particularly following recent Japanese and Saudi updates, alongside persistent diagnostic and therapeutic divergence that may influence clinical practice and equity of care. The absence of region-specific HFpEF guidance in Africa represents a key gap. Greater harmonization of diagnostic pathways, wider adoption of validated scoring systems, and improved contextualization of management across diverse health systems are needed.

Categories: Cardiology, Public Health, Internal Medicine

Keywords: clinical practice guidelines, diagnostic scoring, guideline synthesis, heart failure, hfpef, natriuretic peptides, preserved ejection fraction, sglt2 inhibitors

Introduction And Background

Heart failure (HF) affects more than 64 million people worldwide and contributes substantially to morbidity, mortality, and health care expenditure [1,2]. Heart failure with preserved ejection fraction (HFpEF) is now the most prevalent HF phenotype, accounting for approximately half of all cases and rising in parallel with aging populations and increasing multimorbidity [3]. Mortality remains comparable to that of heart failure with reduced ejection fraction (HFrEF), despite the historical absence of established disease-modifying therapies [4].

HFpEF is defined by typical symptoms and signs of HF, a left ventricular ejection fraction (LVEF) $\geq 50\%$, and objective evidence of structural or functional cardiac abnormalities alongside elevated natriuretic peptides [1]. This definition belies substantial pathophysiological heterogeneity, encompassing diastolic dysfunction, impaired ventricular-arterial coupling, systemic inflammation, and chronotropic incompetence [5]. Distinct

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clinical phenotypes, including obesity-related HFpEF, characterized by expanded plasma volume and impaired natriuresis [6], and atrial fibrillation (AF)-related HFpEF, characterized by loss of atrial kick and elevated filling pressures [7], further complicate diagnosis and treatment.

Diagnostic uncertainty has prompted the development of structured scoring systems. The H₂FPEF score offers a simple, clinically driven approach [8], while the HFA-PEFF algorithm, endorsed by the European Society of Cardiology (ESC), provides a more detailed, stepwise pathway incorporating functional testing and advanced imaging [9]. Guideline endorsement of these tools varies considerably: the ESC strongly supports HFA-PEFF, the American College of Cardiology (ACC) recommends both HFA-PEFF and H₂FPEF, and the National Institute for Health and Care Excellence (NICE) endorses neither, relying instead on natriuretic peptide thresholds and echocardiography [10].

Therapeutically, the field was transformed by trials such as EMPEROR-Preserved and DELIVER, which demonstrated that sodium-glucose cotransporter 2 (SGLT2) inhibitors reduce HF hospitalization across the HFpEF spectrum [11,12], prompting near-universal guideline endorsement as foundational therapy. By contrast, uncertainty persists around mineralocorticoid receptor antagonists (MRAs) and angiotensin receptor-neprilysin inhibitors (ARNIs): the TOPCAT trial suggested regionally inconsistent benefit from spironolactone [13], and the PARAGON-HF trial narrowly missed its primary endpoint while suggesting benefit at the lower end of the preserved ejection fraction range [14].

Guidelines differ substantially across regions in diagnostic thresholds, endorsement of scoring systems, strength of recommendation for MRAs and ARNIs, emphasis on phenotype-specific management, and follow-up strategies. These differences risk inconsistent clinical practice, unequal access to diagnostics and evidence-based therapy, and variation in outcomes. No recent review has synthesized HFpEF recommendations across the full range of major global guidelines. Given the rapid accumulation of evidence and multiple guideline updates between 2021 and 2026, a comprehensive, contemporary synthesis is both timely and necessary.

This review aimed to identify, appraise, and synthesize recommendations for the diagnosis, management, and follow-up of HFpEF across major international and national clinical practice guidelines to (i) compare diagnostic definitions and classification criteria; (ii) evaluate natriuretic peptide thresholds, echocardiographic criteria, and diagnostic scoring systems; (iii) synthesize pharmacological and nonpharmacological management recommendations; (iv) examine follow-up and monitoring guidance; and (v) explore the underlying reasons for and clinical implications of guideline variation.

Review

Methods

Design

This was a qualitative systematic review and comparative analysis of international and national HFpEF clinical practice guidelines, informed by the principles of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework and adapted for the review of guideline documents [15,16]. The review comprised four stages: identification of potentially relevant guidelines; title/abstract screening; full-text eligibility assessment; and structured data extraction, quality appraisal, and narrative synthesis.

Eligibility Criteria

Guidelines were eligible if issued by a recognized cardiovascular society, national health organization, or governmental body; developed using systematic evidence review or formal consensus methodology; applicable to adults (≥ 18 years); published between 1 January 2014 and 31 March 2026; available in English; and represented the most recent version at the time of the search. Documents were excluded if superseded by a later version, focused exclusively on HFrEF or pediatric HF, comprised expert opinion without formal methodology, were local institutional protocols, or lacked HFpEF-specific content.

Search Strategy and Selection

Searches were conducted between February and March 2026 across MEDLINE, Embase, CINAHL, and Scopus, guideline repositories, the Guidelines International Network, and professional society websites, including: ESC, ACC, American Heart Association (AHA), Heart Failure Society of America (HFSA), NICE, the Canadian Cardiovascular Society (CCS), Canadian Heart Failure Society (CHFS), the Japanese Heart Failure Society (JHFS), the Japanese Circulation Society (JCS), the Chinese Society of Cardiology (CSC), the Cardiac Society of Australia and New Zealand (CSANZ), the Russian Society of Cardiology (RSC), the Saudi Heart Association (SHA), the Korean Society of Heart Failure (KSHF), the Brazilian Society of Cardiology (Sociedade Brasileira de Cardiologia, SBC), the Heart Failure Association of India (HFAI), and the Pan-African Society of Cardiology (PASCAR). The following search string was used: “heart failure,” “HFpEF,” “preserved ejection fraction,” “guideline,” “recommendation,” and “consensus statement.”

The search identified 1,061 records (MEDLINE, 312; Embase, 427; CINAHL, 54; Scopus, 198; guideline repositories, 41; and society websites, 29). After 284 duplicates were removed, 777 unique records underwent independent title/abstract screening by two reviewers. Of these, 702 were excluded, leaving 75 for full-text review. Of these 75 documents, 60 were excluded (18 superseded, 21 HFrEF-focused, 11 without formal methodology, and 10 non-English), resulting in 15 included documents representing guidelines and updates from Europe, North America, South America, Asia, and Oceania. The guideline selection process is summarized in Figure 1 (PRISMA flow diagram). Documents from PASCAR were reviewed for contextual relevance but excluded from the formal synthesis because they provide capacity-building frameworks rather than diagnostic or therapeutic recommendations.

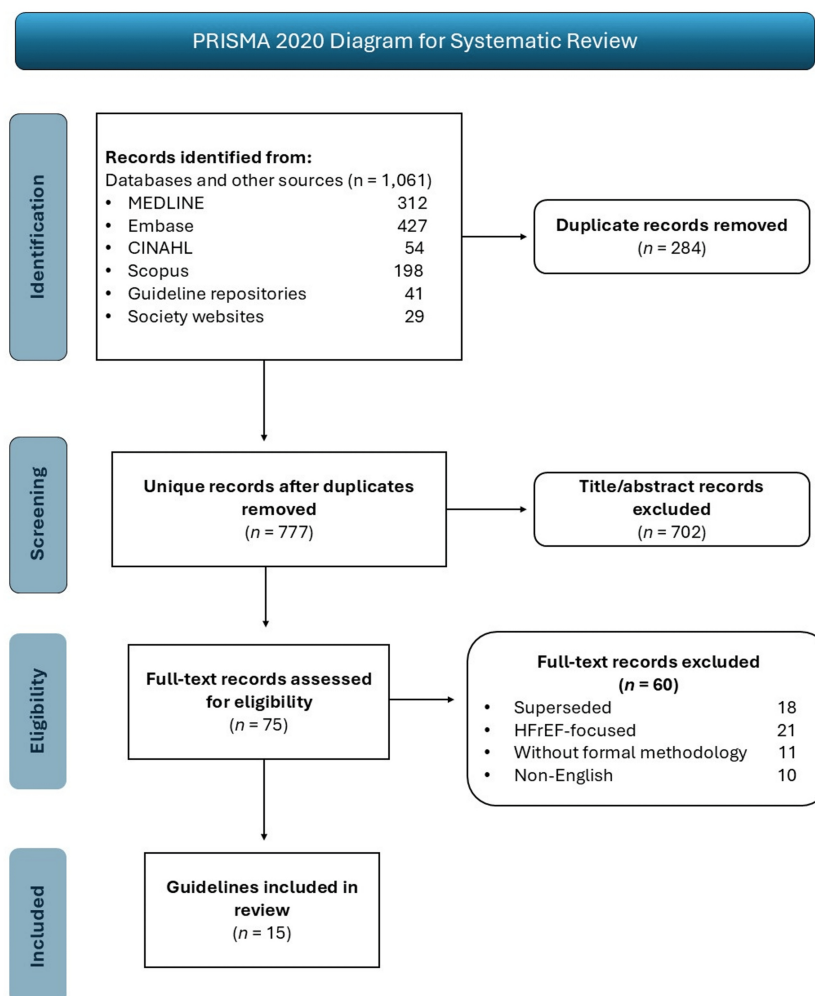


FIGURE 1: PRISMA 2020 flow diagram of guideline selection

Flow diagram illustrating the identification, screening, eligibility assessment, and inclusion of clinical practice guidelines in this systematic review. A total of 1,061 records were identified through database searches and other sources, and 284 duplicates were removed. Following title and abstract screening, 75 full-text records were assessed for eligibility. Of these, 15 guidelines met the inclusion criteria and were included in the final review. Reasons for full-text exclusion included superseded guidelines, documents focused on HFrEF, lack of formal guideline methodology, and non-English publications.

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; HFrEF, heart failure with reduced ejection fraction

Data Extraction and Quality Appraisal

A structured, piloted extraction form was used to independently capture publication characteristics, diagnostic criteria and pathways, natriuretic peptide thresholds, use of scoring systems, pharmacological and nonpharmacological recommendations, comorbidity guidance, follow-up strategies, and evidence grading, with discrepancies resolved by discussion. Methodological quality was appraised by two

independent reviewers using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument across six domains: scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence [17].

Standardized domain scores were calculated independently for each domain as a percentage of the maximum possible score using the following formula:

$$\text{Standardized Domain Score} = \frac{\text{Obtained Score} - \text{Minimum Possible Score}}{\text{Maximum Possible Score} - \text{Minimum Possible Score}} \times 100$$

For standardized quality appraisal, subsequent focused updates or consensus pathways, specifically those from the ESC, ACC/AHA/HFSA, and SHA, were appraised alongside their foundational parent texts to ensure methodological continuity, resulting in 12 core units of analysis. The PASCAR framework, which functions as a regional endorsing and implementing body rather than an independent guideline author, was excluded from quantitative AGREE II scoring but included in the qualitative synthesis to evaluate regional implementation and endorsement strategies.

Synthesis

Given the heterogeneity in guideline structure, terminology, and evidence-grading systems, a narrative synthesis approach was used, supported by comparative tables aligning diagnostic criteria, pharmacological recommendations, and follow-up strategies across guidelines. This study involved the synthesis of publicly available documents only; no patient-level data were used.

Results

Characteristics of Included Guidelines

The included guidelines and updates were published between 2018 and 2025, with the majority released after 2021, reflecting the rapid evolution of HFpEF evidence following EMPEROR-Preserved and DELIVER. ESC 2023 was the first major guideline to assign a Class I, Level A recommendation to SGLT2 inhibitors in HFpEF [18]; NICE incorporated SGLT2 inhibitors into UK practice for the first time in its 2025 update; and the 2023 ACC HFpEF Consensus Pathway provided the most detailed phenotype-specific guidance to date [19]. Evidence-grading systems differed considerably: ESC and AHA/ACC/HFSA use Class I-III and Level of Evidence (LOE) A-C systems [20], NICE uses narrative, cost-effectiveness-informed recommendations, and other societies use modified Grading of Recommendations Assessment, Development and Evaluation (GRADE) or region-specific systems, which complicated direct comparisons of recommendation strength. These differences are summarized in Table 1.

Guideline	Authors	Region	Year	Scope	Evidence system
ESC HF guidelines	McDonagh et al. [1]	Europe	2021	Full guideline	Class I-III + LOE A-C
ESC focused update	McDonagh et al. [21]	Europe	2023	HFpEF update	Class I-III + LOE A-C
AHA/ACC/HFSA HF guideline	Heidenreich et al. [2]	USA	2022	Full guideline	Class I-III + LOE
ACC HFpEF Consensus Pathway	Kittleson et al. [19]	USA	2023	HFpEF-specific consensus	Narrative + class/LOE
NICE NG106	NICE [10]	UK	2018 (updated 2025)	HF diagnosis & management	Narrative/cost-effectiveness
CCS/CHFS update	Virani et al. [22]	Canada	2025	HFmrEF update	Class/LOE
JCS/JHFS guideline	Kitai et al. [23]	Japan	2025	Full guideline	Class/LOE
Chinese Society of Cardiology Guideline	Zhang et al. [24]	China	2024-2025	Full guideline	Class/LOE
CSANZ/NHFA guideline	Atherton et al. [25]	Australia/New Zealand	2018	Full guideline	Class/LOE
KSHF	Cho et al., Hyun et al., Youn et al. [26-28]	Korea	2022	Full guideline	Class/LOE
BSC HF guidelines	Marcondes-Braga et al. [29]	Brazil	2021	Guideline update	Class/LOE
HFAI	Mohan et al. [30]	India	2022	Full guideline	Class/LOE
RSC guideline	Galyavich et al. [31]	Russia	2020/2024	Full guideline	Class/LOE
SHA/NHC guideline	Al Habeeb et al. [32]	Saudi Arabia	2019	Full guideline	Class/LOE
SHA Update	Al Habeeb et al. [33]	Saudi Arabia	2023	Focused update	Class/LOE

TABLE 1: Characteristics of included guidelines

This table summarizes the geographical origin, year of publication, scope, and evidence-grading framework of the 15 heart failure guidelines included in the review. Most guidelines employed a recommendation class and LOE system, while some used narrative evidence appraisal and consensus-based recommendations.

ACC, American College of Cardiology; AHA, American Heart Association; BSC, Brazilian Society of Cardiology; CCS, Canadian Cardiovascular Society; CHFS, Canadian Heart Failure Society; CSANZ, Cardiac Society of Australia and New Zealand; ESC, European Society of Cardiology; HF, heart failure; HFAI, Heart Failure Association of India; HFpEF, heart failure with preserved ejection fraction; HFSA, Heart Failure Society of America; HFmrEF, heart failure with non-reduced ejection fraction; JCS, Japanese Circulation Society; JHFS, Japanese Heart Failure Society; KSHF, Korean Society of Heart Failure; LOE, level of evidence; NHFA, National Heart Foundation of Australia; NICE, National Institute for Health and Care Excellence; RSC, Russian Society of Cardiology; SHA, Saudi Heart Association

Methodological Quality Appraisal (AGREE II Metrics)

The independent application of the AGREE II tool demonstrated significant methodological heterogeneity across the 12 evaluated guideline units. The baseline inter-rater reliability was excellent, yielding an intraclass correlation coefficient (ICC) of 0.88 (95% CI, 0.83-0.92), confirming high calibration between appraisers. The ICC was calculated using a two-way random-effects model for absolute agreement. Standardized domain scores for all evaluated guideline units are detailed in Appendix 1.

Narrative Breakdown of AGREE II Performance Gaps

Domain 2 (stakeholder involvement): High-income Western frameworks (ACC/AHA/HFSA, ESC, and NICE) excelled by actively integrating patient advocacy groups and multidisciplinary panels, including pharmacists, nursing specialists, and health economists. In contrast, several national frameworks scored substantially lower, most notably the RSC at 63% and the SBC at 68%. This was primarily driven by a lack of transparent reporting regarding patient and public involvement (PPI) and a development panel dominated almost

exclusively by academic cardiologists, omitting primary care perspectives [31].

Domain 3 (rigor of development): The ACC/AHA/HFSA (96%) and NICE (95%) guidelines established the benchmark by explicitly linking evidence tables from systematic reviews to recommendation grades. The HFAI scored 68% in this domain. This lower score does not reflect clinical inaccuracy but rather a lack of explicit documentation detailing the database search strategy, full disclosure of the selection criteria, or a formalized process for handling internal consensus gridlocks [30].

Domain 5 (applicability): This domain exposed the most critical vulnerabilities across the global landscape. NICE (UK) scored the highest (88%) due to its mandatory integration of health economics, cost-effectiveness modeling, and clear audit criteria. Conversely, the RSC at 45% and the SBC at 48% failed to provide specific clinician toolkits, cost-impact analyses, or assessments of barriers to implementation. This lack of practical implementation resources leaves community clinicians without a clear roadmap for translating recommendations into standard clinical practice [34].

Diagnostic Criteria and Natriuretic Peptide Thresholds

There was strong global consensus on the core diagnostic definition of HFpEF: symptoms and signs of HF, LVEF $\geq 50\%$, objective evidence of structural or functional cardiac abnormalities, and elevated natriuretic peptides. This definition was consistent across all reviewed guidelines and updates. Natriuretic peptide thresholds, however, varied markedly: ESC recommends N-terminal pro-B-type natriuretic peptide (NT-proBNP) ≥ 125 pg/mL in sinus rhythm (≥ 365 pg/mL in AF); NICE requires >400 pg/mL for routine referral and $>2,000$ pg/mL for urgent review; AHA/ACC/HFSA specifies no single mandated diagnostic cutoff, requiring only “elevated NP consistent with HF,” but commonly uses ≥ 125 pg/mL for nonacute presentations and ≥ 300 pg/mL for acute presentations; and other reviewed guidelines apply thresholds similar to those of ESC. NICE’s comparatively higher threshold reflects cost-effectiveness modeling that may reduce unnecessary referrals but risks underdiagnosis, particularly in patients with obesity, whose natriuretic peptide levels are characteristically lower, as demonstrated in HFA-ESC diagnostic accuracy studies and obesity-specific HFpEF phenotyping studies [9,35]. Most guidelines acknowledge that age and obesity influence natriuretic peptide concentrations, but formal age- or BMI-adjusted thresholds are explicitly proposed only in recent HFA-ESC recommendations [35].

Phenotype Classification

The 2023 ACC HFpEF Consensus Pathway provided the most detailed phenotype framework, distinguishing obesity-related, AF-related, hypertensive, ischemic, pulmonary hypertension-associated, cardiorenal, and amyloid/infiltrative HFpEF [19]. ESC acknowledged phenotypic heterogeneity without a formal classification, emphasizing comorbidity-driven mechanisms [1]. NICE did not classify HFpEF by phenotype, whereas JCS/JHFS placed greater emphasis than Western guidelines on identifying cardiac amyloidosis, hypertrophic cardiomyopathy, frailty, and AF, reflecting regional epidemiology [23]. None of the other documents formally subclassified HFpEF into mandatory phenotypes.

Diagnostic Tools

Diagnostic pathways diverged substantially. ESC’s HFA-PEFF algorithm remains the most structured, probability-based pathway, combining pretest assessment, natriuretic peptides, and echocardiography with a weighted scoring system and advanced testing (diastolic stress echocardiography, invasive hemodynamic assessment, and cardiopulmonary exercise testing) for indeterminate cases [9]. The 2023 ACC pathway recommends using H₂FPEF in primary care and HFA-PEFF in specialist settings as complementary tools [8,9]. The ACC permits invasive hemodynamic assessment in a broader range of diagnostically uncertain cases, whereas ESC recommends prioritizing noninvasive stress echocardiography and reserving invasive measures for situations in which noninvasive modalities are unavailable or inconclusive [1,19]. The 2022 AHA/ACC/HFSA guideline acknowledges both scores without mandating either. NICE does not endorse either scoring system; the guideline cites resource constraints and primary care feasibility concerns, relying instead on natriuretic peptide thresholds and echocardiography rather than structured scoring algorithms [36]. The other guidelines generally acknowledge both scoring tools as useful adjuncts in diagnostically challenging cases, but they do not incorporate them as central components of their core diagnostic algorithms, as ESC and ACC documents do.

Pharmacological and Co-morbidity Management

Pharmacological recommendations showed the greatest divergence, reflecting differences in evidence interpretation, regulatory approval, and health system priorities (Table 2). SGLT2 inhibitors were the only therapy consistently endorsed at a high level across all guidelines following EMPEROR-Preserved and DELIVER [11,12], representing the strongest area of global alignment. Recommendations for MRAs and ARNIs were markedly less consistent, reflecting mixed trial evidence, including regionally variable spironolactone efficacy in TOPCAT [13] and borderline, subgroup-dependent benefit for sacubitril/valsartan in PARAGON-HF [14]. ACE inhibitors, angiotensin receptor blockers, and beta-blockers were universally

regarded as appropriate only for comorbidity management (hypertension and AF rate control) rather than as disease-modifying HFpEF therapies. Diuretics were universally endorsed for symptomatic congestion, making them the most consistently recommended therapy after SGLT2 inhibitors. AHA/ACC/HFSA guidance provides the most explicit phenotype-based treatment strategy, whereas ESC and related international guidelines largely focus on SGLT2 inhibition, decongestion, and rigorous management of comorbidities. Comorbidity management was universally emphasized, given HFpEF's status as a multimorbidity-driven syndrome [37]. AF, which is highly prevalent in HFpEF, was managed with early rhythm control in selected patients under ACC, ESC, and CCS guidance, whereas NICE favored rate-control-first strategies, consistent with broader AF management guidance [38]. Hypertension control, SGLT2 inhibitor use in diabetes, cautious diuretic titration and potassium monitoring in chronic kidney disease, and frailty and polypharmacy assessment in older adults were consistently recommended.

Therapy	ESC	ACC/AHA	NICE	CCS & CSANZ	JCS/JHFS	Other guidelines
SGLT2 inhibitors	Strongly recommended	Strongly recommended	Increasingly incorporated	Strong endorsement	Recommended	Recommended
MRAs	Consider in selected patients	Consider in selected patients	For consideration (hyperkalemia risk)	Selective	Selective (hyperkalemia risk)	Consider
ARNI (sacubitril/valsartan)	Consider in selected patients	Consider in selected patients	Not recommended	Consider	Consider	Consider
ACE inhibitors/ARBs	Comorbidity only	Comorbidity only	Commonly used	Comorbidity only	Comorbidity only	Comorbidity only
Beta-blockers	AF rate control only	AF rate control only	AF/hypertension	AF rate control only	AF rate control only	AF rate control only
Diuretics	For congestion	For congestion	For congestion	For congestion	For congestion	For congestion
Phenotype-directed therapy	Moderate emphasis	Strong emphasis	Minimal	Moderate	Moderate	Limited

TABLE 2: Pharmacological recommendations across representative guidelines

This table summarizes recommendations for key therapeutic strategies in HFpEF across major international clinical practice guidelines[1,2,10,19,21-33]. Areas of consensus and variation are highlighted, including recommendations for SGLT2 inhibitors, MRAs, ARNIs, ACE inhibitors, ARBs, beta-blockers, diuretics, and phenotype-directed management approaches. Recommendation strength was categorized according to the wording and intent of each guideline rather than through direct comparisons of recommendation classes, which vary among organizations.

ACE, angiotensin-converting enzyme; ACC, American College of Cardiology; AHA, American Heart Association; ARB, angiotensin receptor blocker; ARNI, angiotensin receptor-neprilysin inhibitor; CCS, Canadian Cardiovascular Society; CSANZ, Cardiac Society of Australia and New Zealand; ESC, European Society of Cardiology; HFpEF, heart failure with preserved ejection fraction; JCS, Japanese Circulation Society; JHFS, Japanese Heart Failure Society; MRA, mineralocorticoid receptor antagonist; NICE, National Institute for Health and Care Excellence; SGLT2, sodium-glucose cotransporter 2

Non-pharmacological Management

All guidelines endorsed exercise training and lifestyle modification as core components of HFpEF management and explicitly recommended structured cardiac rehabilitation. The ACC pathway provided the most detailed guidance on obesity-related HFpEF, including structured weight-management programs, GLP-1 agonists, and bariatric surgery for severe obesity [6], while other guidelines addressed weight loss less specifically.

There is near-universal agreement across guidelines on management strategies, including patient education and self-management, daily symptom surveillance, monitoring for fluid retention, sodium moderation, smoking cessation, limiting alcohol intake, and managing sleep-disordered breathing.

Follow-Up and Monitoring

Follow-up recommendations for HFpEF are broadly similar across international guidelines and are largely individualized according to clinical stability, treatment changes, and hospitalization history. NICE recommended annual review for stable patients, reflecting a more resource-conservative, primary-care-led approach, whereas ESC, AHA/ACC/HFSA, CCS, CSANZ, JCS/JHFS, CSC, KSHF, BSC, SHA, RSC, and HSAI emphasized risk-based follow-up and early review after hospitalization rather than fixed reassessment intervals [39,40]. Common monitoring parameters included symptoms, functional status, volume status,

renal function, and electrolytes, with ESC, ACC, CCS, and JCS additionally recommending selective natriuretic peptide monitoring. ESC regarded telemonitoring as supportive, although the evidence was variable. ACC/AHA/HFSA showed increasing support for telemonitoring, particularly in high-risk populations. CCS and CSANZ were the strongest supporters of remote management systems, especially for geographically dispersed populations, while NICE supported telemonitoring where appropriate but cautioned against routine implementation. The guidelines agreed that NT-proBNP is useful for diagnosis, but routine biomarker-guided treatment adjustment is not universally recommended. Table 3 provides an overview of nonpharmacological management and follow-up recommendations.

Domain	ESC	ACC/AHA/HFSA	NICE	CCS & CSANZ	JCS/JHFS	Other guidelines
Self-care education	Strong	Strong	Strong	Strong	Strong	Strong
Exercise rehabilitation	Strong	Strong	Strong	Strong	Strong	Strong
Multidisciplinary HF clinics	Very strong emphasis	Very strong emphasis	Moderate	Strong	Strong	Moderate to strong
Phenotype-specific management	Moderate	Strongest	Limited	Moderate	Moderate	Limited
Obesity-focused management	Moderate	Strongest	Limited	Moderate	Limited	Limited
Frailty assessment	Moderate	Moderate	Moderate	Moderate	Strongest	Limited
Telemonitoring	Moderate	Strong	Strong	Strong	Moderate	Variable
Review timeline	Less explicit	Less explicit	Most explicit (annual)	Variable	Variable	Variable
Palliative/supportive care integration	Strong	Strong	Moderate	Strong	Strong	Moderate

TABLE 3: Nonpharmacological management and follow-up summary

This table compares recommendations for nonpharmacological management, multidisciplinary care, patient support strategies, and follow-up approaches in HFpEF across major international guidelines [1,2,10,19,21-32]. Strong agreement exists regarding patient self-care education, exercise-based cardiac rehabilitation, and multidisciplinary heart failure management. Notable differences are observed in the emphasis placed on phenotype-specific treatment, obesity management, frailty assessment, telemonitoring, review timelines, and the integration of palliative or supportive care. Recommendation strength reflects the relative emphasis and prominence of each intervention within individual guideline documents rather than direct comparisons of formal recommendation classes.

Recommendation categories (e.g., "strong," "moderate," and "limited") represent a qualitative synthesis of the emphasis placed on each domain within the respective guidelines and do not necessarily correspond to standardized recommendation classes or levels of evidence.

ACC, American College of Cardiology; AHA, American Heart Association; CCS, Canadian Cardiovascular Society; CSANZ, Cardiac Society of Australia and New Zealand; ESC, European Society of Cardiology; HF, heart failure; HFpEF, heart failure with preserved ejection fraction; HFSA, Heart Failure Society of America; JCS, Japanese Circulation Society; JHFS, Japanese Heart Failure Society; NICE, National Institute for Health and Care Excellence

Cross-Guideline Synthesis

Areas of strong global consensus included the HFpEF definition, the roles of natriuretic peptides and echocardiography, SGLT2 inhibitors as foundational therapy, diuretics for congestion, comorbidity-focused care, and the importance of multidisciplinary management. Areas of moderate consensus included the use of MRAs and ARNI, the roles of cardiopulmonary exercise testing and invasive hemodynamics, and blood pressure targets. The most significant areas of divergence were natriuretic peptide thresholds (particularly ESC versus NICE), the choice of diagnostic scoring system (HFA-PEFF vs H2FPEF vs none), rhythm versus rate control in AF, follow-up intervals, and phenotype-specific guidance.

Discussion

Convergence on the Core Definition: A Major Step Forward

The strong global agreement on the fundamental diagnostic definition of HFpEF represents significant maturation of the syndrome as a clinical entity, reflecting the influence of consensus documents such as the ESC 2021 [1] and AHA/ACC/HFSA 2022 [2] guidelines. Earlier decades were characterized by inconsistent definitions that hindered research comparability and clinical implementation; the present convergence

strengthens diagnostic consistency and cross-regional comparability of outcomes. However, agreement on the definition does not extend to agreement on how that definition should be operationalized in practice.

Diagnostic Scoring Systems: Sensitivity Versus Feasibility

The lack of consensus on diagnostic scoring systems reflects deeper philosophical divergence: ESC and JCS prioritize diagnostic precision through structured, resource-intensive algorithms; the ACC pathway favors flexibility and complementary use of both HFA-PEFF and H₂FPEF; and NICE prioritizes feasibility and primary care usability, foregoing formal scoring in favor of simpler thresholds [10]. This divide has direct clinical consequences: a patient with obesity-related HFpEF and low natriuretic peptide levels may be missed under NICE's higher thresholds while being captured under ESC or ACC pathways, whereas ESC's lower thresholds may increase referral volume and pressure on specialist services. Reconciling diagnostic sensitivity with system-level feasibility remains an unresolved tension in guideline design.

SGLT2 Inhibitors: A Unifying Breakthrough

The near-universal endorsement of SGLT2 inhibitors marks the first time a disease-modifying therapy has been consistently recommended for HFpEF across regions and demonstrates the field's capacity to rapidly incorporate strong, generalizable trial evidence [11,12]. This rapid, coordinated adoption, particularly by ESC in 2023 and NICE in 2025, nonetheless raises unresolved questions regarding affordability across health systems, safe use in frail or multimorbid patients, and the durability of trial benefits in real-world populations.

Persistent Uncertainty Around MRAs and ARNI

In contrast, recommendations for MRAs and ARNI remain inconsistent, reflecting divergent interpretations of subgroup findings from TOPCAT [13] and PARAGON-HF [14] rather than fundamentally different evidence bases. NICE's cautious endorsement appears shaped by the risk of hyperkalemia [10,13]. This uncertainty highlights the continued need for phenotype-specific trials and clearer identification of responder subgroups rather than further trials in unselected HFpEF populations.

Comorbidity-Focused Care: Universal but Variably Implemented

HFpEF is increasingly recognized as a multimorbidity-driven syndrome [37], and comorbidity management was consistently emphasized across guidelines, although its depth and specificity varied. The ACC pathway offers the most granular phenotype-specific guidance, while NICE emphasizes primary-care-led management and Asian guidelines emphasize frailty and aging-related considerations. These differences plausibly reflect underlying variation in population demographics and comorbidity prevalence rather than disagreement about clinical priorities [23,28].

Reasons for Guideline Variation

Guideline divergence reflects several interacting drivers: differing tolerance for uncertainty and emphasis on subgroup evidence; health system structure and resource availability (NICE's higher thresholds and limited use of advanced diagnostics reflect a population-level, cost-effectiveness-driven NHS model, whereas ESC and ACC assume broader access to specialist services); regional differences in comorbidity prevalence (e.g., high burdens of hypertension, AF, and CKD shaping Asian guideline emphasis [41] and high obesity prevalence shaping U.S. guidance [42]); and explicit incorporation of cost-effectiveness modeling, which remains unique to NICE among the reviewed guidelines.

Temporal Evolution Versus True Cross-Sectional Differences

Some variation between guidelines reflects temporal evolution rather than true disagreement. Earlier documents could not incorporate evidence from pivotal HFpEF trials such as EMPEROR-Preserved [11] and DELIVER [12], whereas more recent updates from ESC (2023) [21] and NICE (2025) [39] incorporate these findings. However, even among contemporary guidelines, meaningful cross-sectional differences persist, including divergent natriuretic peptide thresholds (particularly NICE's higher cutoffs [36] and ESC's age-adjusted thresholds [35]), differing endorsement of diagnostic scoring systems (HFA-PEFF [9] vs H₂FPEF [8] vs none), and variation in recommendations for MRAs (TOPCAT [13]) and ARNI (PARAGON-HF [14]) driven by differing interpretations of trial evidence. Distinguishing time-dependent evolution from true intersocietal divergence clarifies where differences are expected and where they reflect deeper structural or methodological variation, strengthening the clinical relevance of this comparative synthesis.

Regional Implementation Challenges: The Case of Sub-Saharan Africa

Sub-Saharan Africa's continued absence of a region-specific formal HFpEF guideline is particularly notable [43,44]. Although the Pan-African Society of Cardiology Heart Failure (PASCAR-HF) program has

substantially advanced capacity building, education, and HF research across the continent, there remains no dedicated pan-African HFpEF guideline [44,45]. As a result, clinicians generally depend on ESC and other internationally derived recommendations, many of which are based on populations and health care settings that differ substantially from those found in Africa, underscoring the need for locally relevant evidence and guidance [43].

Equity and Access Implications

Guideline variation has direct implications for equity. Higher natriuretic peptide thresholds may delay diagnosis in patients with obesity, in whom natriuretic peptide levels are characteristically lower [6,9,35], while reliance on advanced or invasive diagnostics may disadvantage patients in rural or resource-limited settings. Access to SGLT2 inhibitors and cardiac rehabilitation also varies by health system funding model and remains a barrier in low- and middle-income countries [46,47]. Guideline developers and policymakers should explicitly consider these access implications alongside diagnostic accuracy when framing recommendations.

Implications for Guideline Development and Future Research

These findings support several priorities for future guideline development: harmonization of natriuretic peptide thresholds, ideally adjusted for obesity and AF status; a graded diagnostic model in which H₂FPEF is applied in primary care and HFA-PEFF in specialist settings, reserving advanced testing for indeterminate cases; wider incorporation of phenotype-specific diagnostic and therapeutic pathways, building on the ACC 2023 precedent; explicit integration of cost-effectiveness and resource-stratified recommendations to support equitable implementation across health systems of differing capacity; and development of context-appropriate, region-specific guidance for Sub-Saharan Africa, ideally through collaboration among PASCAR, ESC, and the World Health Organization. Priority research areas include validation of diagnostic scores across diverse populations, phenotype-stratified therapeutic trials (including combination therapy and anti-inflammatory and antifibrotic approaches), and real-world evidence on long-term SGLT2 inhibitor effectiveness, adherence, and outcomes in frail and multimorbid populations.

Strengths and Limitations

This review's strengths include a comprehensive, multi-database and multi-society search strategy; inclusion of guidelines from five world regions; structured, dual-reviewer data extraction; AGREE II quality appraisal; and integration of diagnostic, therapeutic, and follow-up recommendations within a single synthesis. Limitations include restriction to English-language guidelines, which may have excluded relevant regional documents; substantial heterogeneity in guideline scope and structure, which limits direct comparability; the inherent constraints of narrative synthesis, which preclude quantitative pooling; and the rapidly evolving evidence base, which means further guideline updates are likely following completion of this review.

Conclusions

This systematic comparative review of 15 international and national guideline documents and updates demonstrates strong global convergence on the core diagnostic definition of HFpEF and the use of SGLT2 inhibitors as foundational, disease-modifying therapy, the first such therapy to achieve near-universal endorsement for this syndrome. Substantial variation persists, however, in natriuretic peptide thresholds, diagnostic scoring systems, recommendations for MRAs and ARNIs, and follow-up strategies, reflecting differences in evidence interpretation, health system structure, epidemiology, and economic priorities. The absence of a formal, region-specific HFpEF guideline in sub-Saharan Africa represents a key structural gap and an important opportunity for future development. Greater harmonization of diagnostic pathways, broader and more consistent adoption of validated scoring systems, explicit attention to equity of access, and closer contextualization of management recommendations to local health system capacity would collectively support more consistent, evidence-based HFpEF care worldwide.

Appendices

Appendix 1

Guideline lineage (core unit of analysis)	D1: scope & purpose (%)	D2: stakeholder involvement (%)	D3: rigor of development (%)	D4: clarity of presentation (%)	D5: applicability (%)	D6: editorial independence (%)	Overall clinical recommendation
ESC (2021 & 2023 Update)	96%	89%	94%	95%	72%	92%	Yes
ACC/AHA/HFSA (2022 & 2023 Pathway)	98%	91%	96%	97%	75%	94%	Yes
NICE (United Kingdom)	94%	93%	95%	91%	88%	90%	Yes
CCS (Canada)	91%	82%	88%	89%	68%	85%	Yes
JCS (Japan)	89%	78%	84%	92%	61%	80%	Yes
CSC (China)	87%	72%	79%	88%	55%	78%	Yes, with modifications
SBC (Brazil)	84%	68%	74%	85%	48%	72%	Yes, with modifications
HFAI (India)	82%	70%	68%	83%	64%	75%	Yes, with modifications
KSHF (Korea)	88%	75%	81%	90%	58%	82%	Yes
CSANZ (Australia/New Zealand)	86%	74%	78%	86%	52%	79%	Yes
RSC (Russia)	80%	63%	70%	82%	45%	68%	Yes, with modifications
SHA (Saudi Arabia; 2019 & 2023 Update)	85%	69%	72%	87%	50%	74%	Yes, with modifications

TABLE 4: AGREE II domain scores across 12 evaluated guideline units

AGREE II, Appraisal of Guidelines for Research and Evaluation II; ACC, American College of Cardiology; AHA, American Heart Association; CCS, Canadian Cardiovascular Society; CSC, Chinese Society of Cardiology; CSANZ, Cardiac Society of Australia and New Zealand; ESC, European Society of Cardiology; HFSA, Heart Failure Society of America; HFAI, Heart Failure Association of India; JCS, Japanese Circulation Society; KSHF, Korean Society of Heart Failure; NICE, National Institute for Health and Care Excellence; RSC, Russian Society of Cardiology; SBC, Brazilian Society of Cardiology; SHA, Saudi Heart Association

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

- Concept and design: Caleb C. Dunkwu, Isha Bashir, Emmanuel Erhieyovwe, Oghenekome S. Aghale
- Acquisition, analysis, or interpretation of data: Caleb C. Dunkwu, Isha Bashir
- Drafting of the manuscript: Caleb C. Dunkwu
- Critical review of the manuscript for important intellectual content: Caleb C. Dunkwu, Isha Bashir, Emmanuel Erhieyovwe, Oghenekome S. Aghale
- Supervision: Caleb C. Dunkwu

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