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New guidelines for managing chronic heart failure patients and new needs in echocardiography

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Conflict of interest:
There are no commercial products involved in this study.
None of the authors have any conflicts of interest.

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Recent advances in heart failure (HF) pharmacotherapy have remodeled the management of heart failure with reduced ejection fraction (HFrEF). The inclusion of angiotensin receptor-neprilysin inhibitor (ARNI) and sodium-glucose cotransporter 2 inhibitors (iSGLT-2) in the therapeutic armamentarium markedly improved the prognosis, symptoms and quality of life of HF patients. As demonstrated, combined treatment with the "fantastic four," including an ARNI, a beta-blocker, a mineralocorticoid receptor antagonist (MRA) and an iSGLT-2, provided benefits of an extra 8.3 years free from cardiovascular death or first HF hospitalization and an extra 6.3 years of survival compared to the former strategy based on an angiotensin-converting enzyme inhibitor and beta blockade [1]. The pathophysiological background of these spectacular clinical effects has been widely proposed; however, it remains speculative in view of the insufficient evidence from available investigations.

One mechanism that may directly underlie the clinical and prognostic benefits in HF is the improvement in the patient hemodynamic status associated with the pharmacological upgrade. According to the HF

definition, both “forward” (decreased output) and “backward” (increased left ventricular (LV) filling pressure) consequences of LV impairment contribute to the pathological milieu in this condition. It has been shown that the hemodynamic profiling of HF patients based on these two features may have prognostic implications [2].

Following this trial, Carluccio et al. [3] investigated the relationship between the prognostic effect of ARNI and drug-induced hemodynamic improvement in a population of patients with HFrEF. The authors revealed that the long-term clinical risk was lower in individuals presenting favorable changes in cardiac output and/or LV filling pressure in response to therapy. This association was independent of LV ejection fraction, clinical factors as expressed by the MAGGIC risk score and natriuretic peptide levels and was more evident at higher drug doses.

In daily practice, noninvasive characterization of HF hemodynamics by echocardiography is the method of choice. The results of the study by Carluccio et al. [3] highlight the role of echocardiography in the prognostic evaluation of HFrEF and suggest the need for serial assessments to track the responses of cardiac performance to treatment to obtain important clinical information. This message may not be in line with the trends postulating the simplification of diagnostic and prognostic algorithms in HF; however, it follows Einstein’s maxim that “everything should be made as simple as possible but not simpler.” Indeed, echocardiography is a useful tool not only for making the diagnosis of HFrEF but also for evaluating the efficacy of treatment, which cannot be judged solely on the basis of clinical data, as nicely demonstrated by Carluccio et al. [3]. Thus, echocardiography can help to optimize medical treatment in HF patients, particularly in cases of therapeutic modifications, diuretic dose adjustments or the introduction of new therapies. The availability of ultrasound and relatively moderate costs further justify the more frequent use of this diagnostic option in HF patients.

Echocardiography is a source of a wealth of information, with multiple parameters describing various aspects of cardiac pathologies, many of which are still awaiting appropriate clinical application. The use

of echocardiography in HF cannot be limited to the evaluation of the forward and backward components of LV dysfunction. The unexpected trend toward prognostic improvement in the subset experiencing hemodynamic deterioration demonstrated in the study by Carluccio et al. [3], particularly seen in the initial phase of treatment as evidenced by the Kaplan–Meier curves, supports the obvious notion that other, nonhemodynamic mechanisms play a role in determining cardio-vascular risk profiles in HF. Accordingly, we have a long way to go to efficiently managing HF patients, but it requires well-planned strategies, including echocardiography, as one of the cornerstones. The increased complexity surrounding the choices that are needed to implement the fantastic four is probably an additional reason to look more carefully at echocardiographic data before and after the introduction of 2, 3 or 4 of the key pharmacological agents, in addition to furosemide, that all patients with HF with preserved ejection fraction might have to receive. The risk/benefit balance of the timing of fantastic four introduction remains a wide window of hope for further investigations (Figure 1).

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Figure 1: Summary slide about the need for echocardiography for better use of the therapeutic opportunities available for systolic heart failure patients

LV: left ventricle; RV: right ventricle; CRT: cardiac resynchronization therapy; TEER: transcatheter edge-to-edge repair; ARNI: angiotensin receptor-neprilysin inhibitor; MRA: mineralocorticoid receptor antagonist; iSGLT2: sodium-glucose cotransporter 2 inhibitors

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ECHOCARDIOGRAPHIC HEMODYNAMIC EVALUATION FOR THERAPEUTIC ADJUSTMENT

« Simple but not simpler » A.Einstein

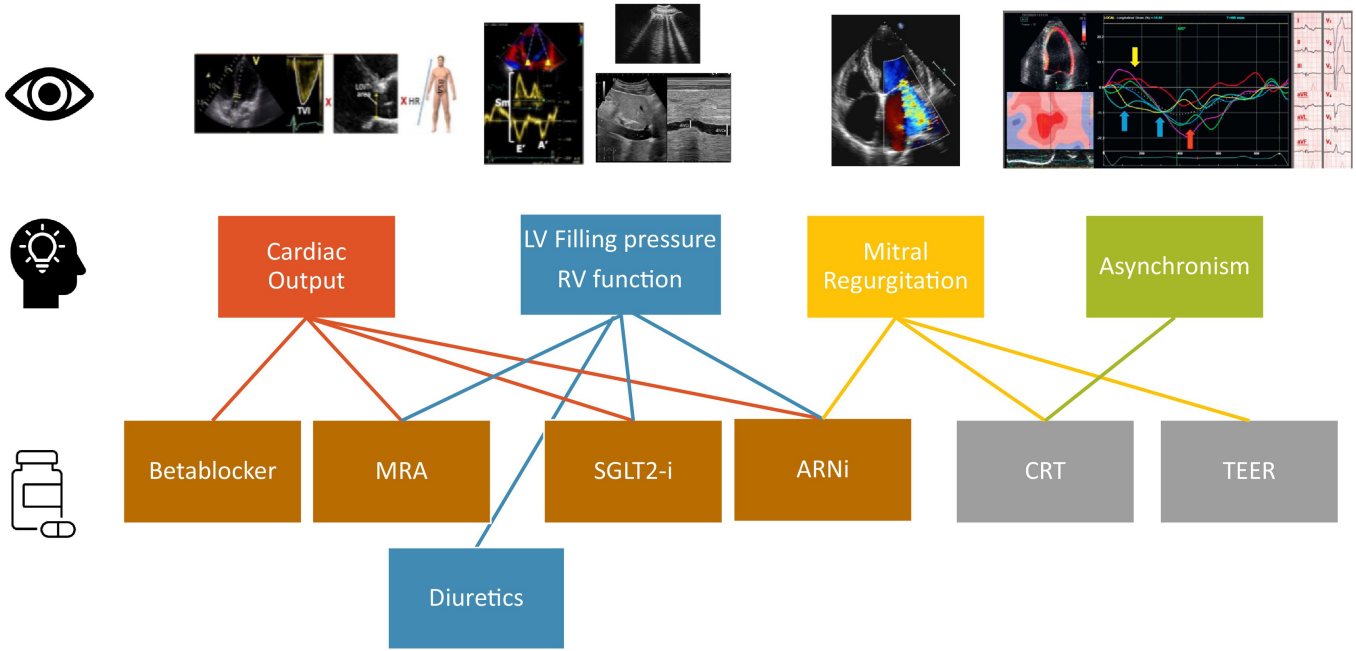


Figure 1