

# Heart Failure: A World in Constant Evolution

## Insuficiência Cardíaca: Um Mundo em Constante Evolução

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In contrast to other major forms of cardiovascular diseases the incidence and prevalence of heart failure (HF) are increasing and the prognosis remains poor. HF can be defined as an abnormality of cardiac structure or function leading to failure of the heart to deliver oxygen at a rate commensurate with the requirements of the metabolizing tissues, despite normal filling pressures or only at the expense of increased filling pressures. HF may have different etiologies, such as coronary artery disease, valvular heart disease, cardiomyopathies and hypertension,<sup>1</sup> that are essential to manage from the first patient approach. Paradoxically, the development of therapeutic interventions that improved the prognosis of the above-mentioned etiological conditions, by reducing the associated mortality, may have contributed to increased HF prevalence.<sup>2</sup> In addition, the currently available medicines and devices for the treatment of HF with reduced ejection fraction itself allowed the achievement of striking improvements in the management of HF, further contributing to the increased overall survival of these patients and, therefore, to the increased prevalence of HF.<sup>2</sup>

The problem affects more than 26 million people worldwide.<sup>3</sup> Approximately 1%–2% of the adult population in developed

countries has HF, with the prevalence rising to 10% among persons 65 years of age or older.<sup>3</sup>

The scenario in Portugal is not better. According to PORTHOS (PORTuguese Heart failure Observational Study),<sup>4</sup> presented at Heart Failure 2024, 700 000 Portuguese people over 50 years old live with HF, and 90% are unaware of the condition. The syndrome is associated with aging, with a prevalence of 4% in individuals aged 50 to 59 and 31% from 70 years old (data not yet published). It is estimated that the prevalence of HF in mainland Portugal will increase by around 30% in 2035 and 33% in 2060. In addition to the large number of HF patients expected, it is estimated that the hospitalizations and mortality associated with this syndrome will significantly increase its economic impact.<sup>5</sup>

Advances in recent decades have revolutionized this area, particularly in terms of new concepts, new forms of monitoring and treatment. Regarding new concepts, the division of the clinical syndrome into phenotypes, according to ejection fraction (on depressed, preserved or slightly decreased) have consequent major therapeutic implications. The concept of cardio-renal-metabolic syndrome emerged, linking several

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pathophysiological pathways and allowing the development of new therapies with prognostic benefit in several simultaneous domains. Also, the concept of “worsening heart failure” was described, trying to highlight the progressive nature of the disease, characterized by episodes of worsening despite continued therapy, decentralizing the focus on historical hospitalization to now include worsening events even on an outpatient basis, signaling a new phase of the disease, with prognostic and therapeutic implications.<sup>6</sup>

Remote monitoring (invasive and non-invasive), increasingly common, now allows the patient’s decompensation to be detected early and facilitates timely treatment, avoiding hospitalization.

Patients will be hospitalized less and less in a hospital environment, thanks to the growth of HF Days Hospitals and Home Hospitalization, here with a key role of HF nursing teams, increasingly specialized in this area.

Regarding HF therapy, major strides have been made in pharmacological and non-pharmacological therapy. Regarding pharmacological therapy, the concept of “4 prognosis-modifying pillars” in HF with reduced ejection fraction (1. beta-blockers, 2. angiotensin and neprilysin receptor antagonists, 3. SGLT2 inhibitors, 4. mineralocorticoid receptor antagonists), with rapid implementation and titration protocols, revolutionized our decade, with unquestionable gains in terms of morbidity and mortality.<sup>7</sup> Specific therapies directed to cardiomyopathies (namely, amyloidosis and hypertrophic cardiomyopathy) have been growing, revolutionizing this rapidly expanding area, with major prognostic gains. Developments in diuretic therapy, with new “diuretics” and new diuretic concepts as diuretic synergism, diuretic efficacy and also, new tools for assessing congestion have stood out in the area of acute heart failure, namely in the difficult task of treatment congestion.<sup>6</sup>

Regarding non-pharmacological therapy, the continuous development of cardiac devices (resynchronizers and defibrillators) and arrhythmia ablation techniques, particularly for atrial fibrillation (present in around 1/3 of HF patients), it is a reality, with a significant reduction of HF events in patients with reduced ejection fraction.<sup>8</sup> There is also an enormous growth in percutaneous coronary and structural cardiac intervention, particularly valvular intervention (on aortic, mitral and tricuspid valve), which positively modulate the natural history of the disease and implies an increasingly multidisciplinary management of these patients.

Finally, in the area of Advanced HF, a concept that reflects the persistence of New York Heart Association class III or IV symptoms, despite optimized medical therapy,<sup>6</sup> heart

transplantation continues to be the gold standard treatment, however, long-term left ventricular assistance devices (LVAD), namely Heartmate 3<sup>®</sup>, are increasingly a real alternative, as a bridge to transplantation or as final destination therapy. In a real-world registry of patients with HeartMate 3<sup>®</sup> LVADs, 5-year survival was 63.3%. This is comparable to clinical trial data.<sup>9</sup> To achieve this, it is essential that HF patients are referred early to well-defined reference centers, which we have already defined in Portugal. Concerning heart transplantation, the number of donors is expected to increase substantially (similar to what recently occurred in Spain), with the introduction in Portugal of heart/organ donation after scheduled cardio-circulatory death (Maastricht 3 program), reducing mortality on the waiting list.<sup>10</sup>

The future and present of HF are a constant challenge not only for patients but also for HF teams, due to the need to constantly adapt to new realities but also due to the imperative need for international, national and regional organization, centered on our HF patient. The world of HF is in constant evolution!

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