

Does Evidence Drive Fluid Volume Restriction in Chronic Heart Failure?



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KEYWORDS

• Heart failure • Fluid restriction • Thirst • Adherence

KEY POINTS

- Fluid restriction is an aspect of heart failure education and management.
- There is no expert consensus on the degree of fluid restriction that is recommended.
- Congestion leads to an increase in symptom burden and disease progression and is target of heart failure therapies.
- Thirst is a common complaint in heart failure patients and can decrease adherence to fluid restriction.

With a changing and aging population, chronic heart failure (HF) remains a challenge to treat with acute decompensations resulting in costly hospital admissions.¹ This complex clinical syndrome is associated with a high degree of mortality and morbidity. Treatment approaches include both pharmacologic and nonpharmacologic strategies. Fluid restriction in chronic HF patients has been a core tenet of education and management plans, but the question remains whether the evidence supports the practice.

Funding Sources: None.

Conflict of Interest: None.

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Nurs Clin N Am 52 (2017) 261–267
<http://dx.doi.org/10.1016/j.cnur.2017.01.003>

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PATHOPHYSIOLOGY OF HEART FAILURE

HF is characterized by structural and functional impairments in ventricular filling and emptying, leading to a complex set of physical manifestations such as dyspnea, fatigue, and edema.^{1,2} The primary driver of these symptoms, and the attributable morbidity and mortality, is thought to be related to congestion. Congestion is an end result of a complex pathophysiologic cascade characterized by alterations in cardiac output. This low cardiac output state impairs renal perfusion, leading to activation of the sympathetic nervous and renin-angiotensin-aldosterone systems with the end result being increased renal sodium and water retention and increased circulating blood volume.^{3,4} Chronic activation of these pathways leads to ventricular remodeling and progressive cardiac impairment,⁵ which leads to increased sodium and water retention and, ultimately, congestion.

Beta-blockers, mineralocorticoid receptor antagonists, and angiotensin-converting-enzyme inhibitors/angiotensin II receptor blockers constitute the core pharmacologic strategies used in chronic HF.² These targeted pharmacologic management strategies of HF are focused on blocking the maladaptive neurohormonal processes inherent in HF. Volume control is essential to preventing congestion, which is accomplished through the use of diuretics, self-care strategies that incorporate sodium and fluid restriction, and daily weight measurements.^{6,7} Nonpharmacologic approaches to volume management rely heavily on a degree of patient self-care, which is influenced by physical, psychological, environmental, and social factors.⁸ Thirst related to the maladaptive disease progression and management strategies is a common complaint in those with late-stage HF.¹ Together, these pharmacologic and non-pharmacologic management strategies aim to prevent both progression and acute decompensation episodes of chronic HF.²

FLUID RESTRICTION: CURRENT STATE OF EVIDENCE

Fluid restriction is recommended in current HF management guidelines, but the science behind the recommendation has not been robust. There is presumption that non-adherence to a sodium and fluid-restricted diet can be a contributing factor to decompensation.² Based on this supposition, coupled with clinical opinion and experience, fluid restriction remains part of current HF guidelines.

GUIDELINES

Current guidelines for fluid restriction in chronic HF are summarized in **Table 1**. The American Heart Association (AHA), European Society of Cardiology (ESC), and Heart Failure Society of America (HFSA) all have published guidelines for the management of chronic HF, including dietary considerations.^{1,2,9} Fluid restriction, although included in some iteration of all published guidelines, is supported by expert opinion as opposed to concrete clinical evidence from randomized controlled trials (RCTs).¹⁰

There is currently no consensus on a specific level of fluid restriction for all patients with HF. In those patients with congestive symptoms, there is agreement that fluid restriction is warranted, although the degree of fluid restriction differs among the groups.^{1,2,9} Both the AHA and the ESC recommend fluid restrictions in those with stage D or severe HF.^{1,2} Hyponatremia is a concerning feature of HF and is associated with increased mortality^{11,12}; both the AHA and the ESC guidelines prompt fluid restriction in scenarios of hyponatremia and end-stage HF.^{1,2} The HFSA⁹ guidelines stipulate that fluid restriction should be considered when congestion persists despite high-dose diuretics and sodium restriction. Only the

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