Proactive Monitoring and Management of the Chronic Heart Failure Patient

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Heart failure affects 5 million Americans, and 550,000 new diagnoses are made each year. It is the underlying or contributing cause of death in 286,700 individuals annually in the United States, and prognosis is particularly poor once a patient has been hospitalized with the condition. In addition to the risk of mortality, patients diagnosed with heart failure have an increased risk of hospitalization. There are approximately 1.1 million primary hospitalizations in the United States, which translates into an annual estimated cost of $23 billion to $56 billion. Therefore, heart failure is associated with high risks and high costs. These statistics emphasize the need to develop and implement more effective strategies to assess, monitor, and treat this serious condition.

Congestion is a major contributor to the symptoms of heart failure. The vast majority of hospitalizations are also related to clinical congestion, rather than to a low cardiac output state. Patients frequently develop sub-clinical congestion several days or weeks before the onset of clinical symptoms and signs. By the

time symptoms and signs are evident, the heart failure patient generally requires hospitalization. Although routinely used in the outpatient setting to detect impending decompensated heart failure, the monitoring of symptoms and signs upon physical examination, and the monitoring of daily weights in patients with heart failure have limitations. It has become increasingly apparent that better strategies geared toward identifying sub-clinical congestions and/or those that anticipate severe episodes of decompensation would be of value in the management of heart failure. Earlier identification and treatment of congestion may thus prevent subsequent hospitalization in patients with chronic heart failure.

Congestion induces several deleterious pathophysiological processes, in addition to contributing to symptoms of and hospitalizations for heart failure. Failure to recognize and adequately address congestion may also increase morbidity and mortality risk. Furthermore, titrating or adjusting drugs and devices may be enhanced by more accurate assessment of congestion and the heart failure disease state. Thus, *proactive monitoring* of these patients is necessary to optimize both therapy and clinical outcomes.

Recent advances have been made in the monitoring of heart failure patients. Continuous ambulatory hemodynamic monitoring, thoracic impedance monitoring, or both, have been shown to provide detailed information on heart failure patients' status that may be helpful in day-to-day volume management. The information provided by this monitoring may further enhance the ability of disease management programs to enhance heart failure patient management. Integrating validated and reproducible noninvasive techniques to monitor chronic heart failure patients in routine clinical practice may thus represent an important advance in guiding the optimization of interventions to improve clinical outcomes.

This supplement will explore the role of congestion in the pathophysiology of heart failure, detail the current approaches to monitoring and management of heart failure, and discuss new techniques and technologies for assessing and monitoring ambulatory hemodynamics and congestion. Illustrative patient case studies will also be presented.

Application of validated and reproducible noninvasive techniques to monitor patients with chronic heart failure is an important step toward maximizing interventions to improve outcomes in this patient population. Further efforts are clearly needed to improve the monitoring of heart failure patients in the hospital and outpatient settings, as well as to ensure the implementation of effective strategies and systems that increase the use of evidence-based therapies, to reduce the substantial heart failure morbidity and mortality risk.

It is our hope that the information contained in this supplement will prove useful in improving the management and care of chronic heart failure patients. ■