



CALIFORNIA TECHNOLOGY ASSESSMENT FORUMSM

CardioMEMS™ HF System (St. Jude Medical) and Sacubitril/Valsartan (Entresto™, Novartis) for Management of Congestive Heart Failure: Effectiveness, Value, and Value-Based Price Benchmarks

Final Background and Scope

September 11, 2015

Background:

Congestive heart failure (CHF) represents a major public health concern, currently affecting nearly 6 million individuals in the US (Mozaffarian, 2015), where the lifetime risk of developing the condition is nearly 20% (Bui, 2011). CHF is associated with 1) substantial morbidity and mortality, with 5-year mortality similar to that of many cancers; and 2) high rates of hospitalization and intensive outpatient care (Bui, 2011; Feltner, 2014). Growth in per capita medical spending and aging of the population are expected to contribute to substantial increases in the direct medical costs of treating CHF, with annual costs totaling nearly \$80 billion by 2030 (Heidenreich, 2011). The management of CHF has seen no major breakthroughs in well over a decade, but two new interventions have the potential to markedly shift clinical practice: 1) a system for monitoring increases in pulmonary artery pressure (a key indicator of worsening CHF) known as CardioMEMS™ (St. Jude Medical) and 2) Entresto™ (Novartis AG), a combination of the angiotensin II receptor blocker (ARB) valsartan and the novel neprilysin inhibitor sacubitril.

Project Aim:

This project will separately evaluate the health and economic outcomes of two interventions: 1) CardioMEMS to monitor patients with CHF, and 2) Entresto for the treatment of CHF.

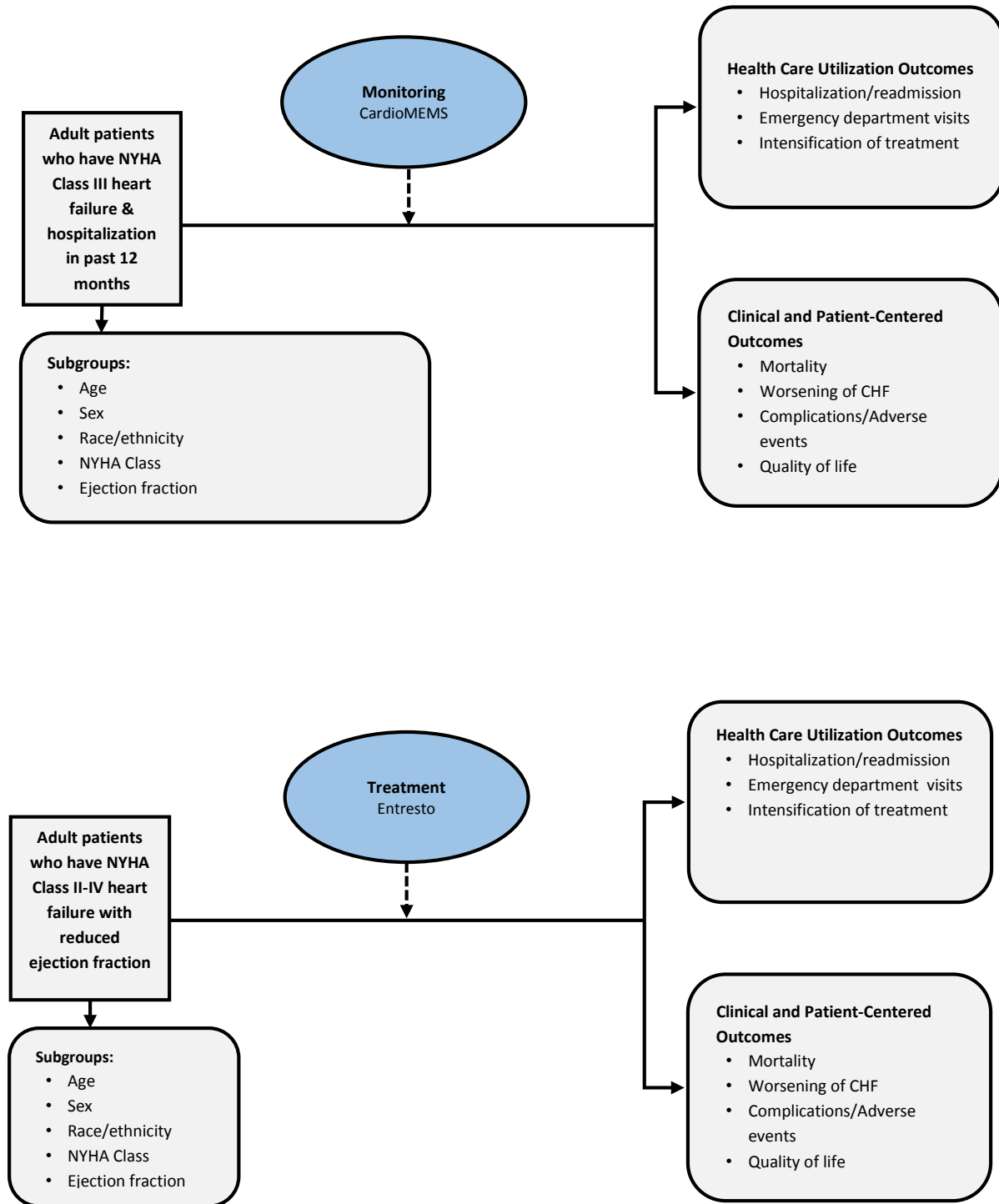
Scope of the Assessments:

The proposed scope for these assessments is described below using the PICOTS (Population, Intervention, Comparators, Outcomes, Timing, and Settings) framework. Evidence will be culled from Phase II or III randomized controlled trials and comparative cohort studies as well as high-quality systematic reviews where available. We will also include case series that meet certain quality criteria (e.g., sample retention, consecutive patients, clearly defined entry criteria).

Analytic Frameworks:

The analytic framework for these assessments is depicted in Figure 1 on the following page.

Figure 1. Analytic Frameworks for Evaluation of CardioMEMS HF System and Entresto*



*Adapted from Feltner, et al., 2014

Populations

The population of focus for the reviews of both interventions will include adult individuals (age 18+) with moderate or severe heart failure (New York Heart Association [NYHA] Class II, III, or IV). While the indications for the interventions of focus have narrower specifications (e.g., CardioMEMS HF System is indicated for NYHA Class III patients with a hospitalization in the previous 12 months), we also included studies of the interventions in patients who did not meet labeled indications. Of note, while the majority of patients evaluated in the key clinical studies of both interventions had reduced ejection fraction (i.e., <40%), we will also evaluate any available evidence from studies including patients with preserved ejection fraction, as these individuals represent approximately 50% of incident cases of heart failure (Gurwitz, 2013).

Interventions

The interventions of interest will include the CardioMEMS system and the medication Entresto, as described above.

Comparators

Comparators for CardioMEMS will include usual CHF monitoring, which may range from less intensive (treatment adjustments in response to signs and symptoms) to more intensive (multi-disciplinary disease management programs). The comparator treatment for Entresto will be the current standard of care, optimized ARB or angiotensin-converting enzyme (ACE) inhibitor treatment with co-administration of beta blockers.

Outcomes

This review will examine clinical and health care utilization outcomes related to both interventions. Listed below are the outcomes of interest:

- Mortality
- Worsening of CHF (i.e., reduced ejection fraction, fluid retention, other laboratory markers)
- CHF-related hospitalizations and readmissions
- Measures of CHF symptoms, functional status, and/or health-related quality of life
- Short- and long-term complications and adverse events of treatment/monitoring
- Costs and cost-effectiveness of CHF management

We will assess the evidence on an overall basis as well as stratified by important baseline characteristics (e.g., age, sex, race/ethnicity, NYHA class, reduced vs. preserved ejection fraction).

Timing

Evidence on intervention effectiveness and harms will be derived from studies of any duration.

Settings

All relevant settings will be considered, including inpatient, clinic, and outpatient settings.

References:

1. Mozaffarian D, Benjamin E, Go AS, et al. Heart disease and stroke statistics—2015 update: A report from the American Heart Association. *Circulation*. 2015; 131: e29–e322.
2. Bui AL, Horwich, TB, Fonarow GC. Epidemiology and risk profile of heart failure. *Nat Rev Cardiol*. 2011; 8(1): 30-41.
3. Feltner C, Jones CD, Cené CW, et al. Transitional Care Interventions to Prevent Readmissions for People with Heart Failure. Comparative Effectiveness Review No. 133. AHRQ Publication No. 14-EHC021-EF; May 2014.
4. Heidenreich PA, Trogdon, JG, Khavjou OA, et al. Forecasting the future of cardiovascular disease in the United States: A policy statement from the American Heart Association. *Circulation*. 2011; 123: 933–944.
5. Gurwitz JH, Magid DJ, Smith DH, et al. Contemporary prevalence and correlates of incident heart failure with preserved ejection fraction. *Am J Med*. May 2013; 126(5):393-400.