Background: Beta blocker (BB) therapy reduces death and hospitalizations in patients with CHF. However, patients with low resting heart rates (HR) are often excluded from BB treatment. We hypothesized that prophylactic pacemaker (PM) insertion to facilitate BB use in these patients would save lives at an acceptable cost. Methods: A Markov model simulated the natural history of a cohort of clinically stable CHF patients (EF ≤ 35%, mean age 60) with a resting HR of 60 bpm. Two strategies were evaluated: 1) Conventional therapy ("conventional") - risks of death and hospitalization were derived from the ACE inhibitor arm of the SOLVD treatment trial. 2) Dual chamber PM insertion and carvedilol therapy ("PM/BB") - risk reductions of death and CHF-related hospitalizations for carvedilol compared to conventional therapy were derived from the US Carvedilol Study. A Cox regression model showed that baseline mortality and the death and hospitalization benefits with carvedilol were independent of resting HR. For the base case, carvedilol benefits were assumed to persist for two years, tapered off over the next three years, and were gone after five years, while PM-related adverse events persisted. Costs and PM complication rates were based on published data, Medicare payment rates and average wholesale drug prices. Results: The PM/BB strategy led to an increased mean survival of 1.6 years (conventional - 6.7; PM/BB - 8.3). These benefits incurred an incremental cost of $6,800 (conventional - $3,377, PM/BB - $9,000). The corresponding incremental cost-effectiveness for the PM/BB strategy was $5,200 per life-year saved. In one-way sensitivity analyses, we varied the costs, complication rates and the mortality and hospitalization benefits with carvedilol between 0.5 and 1.5 of base case values. Results were most sensitive to changes in cost of hospitalization, cost of PM placement, and degree and duration of carvedilol benefit but did not exceed the economically attractive threshold of $4,000 per life-year saved. Conclusion: Prophylactic PM insertion to facilitate carvedilol treatment in CHF patients with low resting HR has the potential to produce substantial clinical benefits at an acceptable cost.