1. INTRODUCTION

BACKGROUND

Studies suggest that case management can improve outcomes and reduce costs for patients with congestive heart failure (CHF) and other chronic conditions, by reducing mortality and hospital length of stay and likelihood of readmission [1-9]. Studies also show improved quality of life (e.g., as measured by SF-36 [16]) and functional status [4,6,10].

The literature cites two mechanisms for producing these improved outcomes. First, the case manager (usually a nurse) monitors patient signs and symptoms (e.g., changes in weight, edema, shortness of breath, and fatigue), and notifies the patient’s physician quickly of any abnormality. Physicians can respond to timely reports of symptoms, for example by adjusting a patient’s medications or admitting the patient to the hospital [2,7]. Patients may consequently avoid a later, more lengthy and costly hospitalization.

Second, the program seeks to reduce the incidence of adverse signs and symptoms by improving the patient’s compliance with prescribed medications, dietary restrictions (e.g., reduced sodium intake), and other behaviors (e.g., exercise, avoidance of alcohol and smoking). Thirty to sixty percent is a typical range for the compliance rate with medications and diet, though the criteria (e.g., how one counts instances of partial compliance) vary from study to study [15,17,18]. By any criterion, however, noncompliance with medications and diet is a substantial cause of heart failure decompensation and subsequent hospitalization [12,13]. Programs attempt to improve compliance by educating the patient concerning the physiology of CHF and its symptoms, reasons for compliance and consequences of noncompliance, training on how to comply, and repeated encouragement, reassurance, reinforcement, and prompting. Studies have indicated that case management can improve compliance, though the reported size of the effect is usually modest.
Further, improved compliance is associated with improved outcomes [3,10,14].

Different programs utilize different means of communicating with the patient. Cordisco [1] had the patient use a “DayLink monitor” to record data daily. Each day the monitor auto-dialed the nurse. Heidenreich [2] required the patient to call a toll-free number and report data to a computerized voice answering system by punching buttons on a touch-tone phone. In one program [21], the patient met face-to-face with various health care professionals in the hospital prior to discharge. The patient also received a 15 page teaching guide, at least one home care visit, and regular telephone contacts from the nurse. Fulmer [10] had the nurse telephone the patient and remind him/her to take his medications. Shah [7] paged the patient daily, providing a reminder to collect data and take medications. In addition written materials were mailed weekly, with each mailing followed by a telephone call from the nurse to discuss the written material, collect the week’s data, and ask the patient about his/her clinical status. West [9] used an initial home visit, followed by regular telephone contacts for six weeks (or longer, for patients who had an ER or hospital visit during the first six weeks).

Health Hero has devised a new method for communicating between the patient and the nurse case manager. They place a device called a Health Buddy™ in the patient’s home. The device (about the size of a clock radio) connects to the Internet with an ordinary telephone jack. Each day, the patient responds to a short automated survey of perhaps a dozen questions, by pressing buttons on the Health Buddy™. Completed surveys² are uploaded to the Health Hero web site at a preset time (e.g., 3:00 AM), and simultaneously the next day’s survey is downloaded. The next morning, the nurse retrieves and reviews the responses of all her cases. Health Buddy™ surveys are designed to collect information about the patient’s symptoms and behavior, and to provide some patient education via scripted quizzes. Only if one or more of a patient’s

² Partially completed surveys are not uploaded. Unless a patient completes all survey questions for a particular day, no answers will appear in the Health Hero database for that patient-day.
responses is “out of range” will the nurse follow up with a telephone call to that patient and, if indicated, an intervention. Logically, a case management program using this means of communication should produce the same improvements in patient outcomes as the programs cited above. It could conceivably yield greater improvements than programs that contact the patient only weekly or less often, due to its greater frequency of communication. Further, automating most of the contacts with the patient should reduce costs, because a single case manager should be able to manage more patients.

PURPOSE OF THE REPORT

The issue addressed in this report is, do patients find Health Buddy™ friendly and accessible, and do they consider it helpful in coping with their disease. Just because the device can make case management more efficient and/or effective does not guarantee that it will do so. For case management using Health Buddy™ to be effective, the daily surveys must ask the right questions, and the case manager must use the information to make the right decisions about when and how to intervene. But to make this possible, the patient must respond regularly to the Health Buddy™ surveys. The patient will not do so if s/he finds it difficult or annoying to use the device.

A comprehensive assessment of Health Buddy™ should also examine patient outcomes, such as survival and hospitalization rates. It should also estimate the monetary costs and savings of case management with Health Buddy™, in comparison to case management by other means. Unfortunately, we have too little data to support an assessment of these matters.

STRUCTURE OF THE REPORT

In this report we present results on this issue from CHF case management programs at two beta test sites for the Health Buddy™. Section 2 describes the two beta sites from which we have been able to collect information. Section 3 discusses patient reports of the ease of setting up the Health Buddy™ and learning to use it. Section 4 discusses patient compliance. That is, do patients respond to Health Buddy™ surveys reasonably frequently and reliably? Section 5 presents
patient self-reports of the effect of Health Buddy™ on their understanding of their condition and their ability to manage it. Section 6 presents surveys of patient satisfaction with the Health Buddy™. Finally, Section 7 presents some summary observations.