SUMMARY

This report addresses patient acceptance of a new device called a Health Buddy™ used to communicate between patients chronically ill with congestive heart failure (CHF) and a health care provider (usually a nurse) in a case management program. 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™. The completed survey is uploaded to the Health Hero¹ 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, and intervenes as necessary.

Data suggest that the appropriate interventions can improve outcomes and reduce costs for CHF patients. Studies show reductions in mortality and hospital length of stay and likelihood of readmission [1-9]. Studies also show improved quality of life and functional status [4,6,10].

The literature cites two mechanisms for achieving these improved outcomes. First, the case manager 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 case manager educates and motivates the patient to improve his or her compliance with prescribed medications, dietary restrictions (e.g., reduced sodium intake), and other behaviors (e.g., exercise, avoidance of alcohol and tobacco). Low medication and diet compliance rates are typical (30-60 percent [11]), and noncompliance is a substantial cause of heart failure decompensation and subsequent

¹ Health Hero, Inc., developed the Health Buddy™ and markets the service based on the device.
hospitalization [12,13]. Studies have indicated improved compliance is
associated with improved outcomes [3,10,14].

In most case management programs, the nurse communicates with
patients by telephone no more frequently than once per week. By
contrast, Health Buddy™ automates most of the communication between
patient and case manager. If the patient uses his Health Buddy™
regularly, a case management program using Health Buddy™ should produce
the same improvements in patient outcomes as telephone-based programs,
and could conceivably produce greater improvements 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.

TWO BETA TEST SITES

We use data from two beta test sites to assess patient acceptance
of Health Buddy™. Site A is an independent practice association of
over 800 physicians that contracts with health insurance plans to
provide medical care to insured individuals. Their Health Buddy™ case
management program began around 3/31/99. Fifty-two patients installed
Health Buddies™ and responded to at least one survey. Site B is a
group of California hospitals. Site B began putting some patients from
an existing case management program on Health Buddy™ in the middle of
July 1999. Ninety-eight patients responded to at least one Health
Buddy™ survey.

This report is based on three datasets from each site. First, we
obtained data from each site on hospital admission and discharge dates
of patients with a diagnosis of congestive heart failure (ICD9
code=428.x). These data covered all hospitalizations from well before
the Health Buddy™ programs began until the ends of the respective study
periods (8/30/99 for site A, 9/15/99 for site B).

Second, we obtained files of responses to Health Buddy™ surveys by
all patients enrolled in the Health Buddy™ programs at the two sites.
For each patient, these files contained all responses from the first
time the patient used his Health Buddy™ through the ends of the study
periods. We used these two datasets to assess patient compliance with Health Buddy™ surveys.

Third, we obtained a subset of responses by patients at the two sites regarding how the patient felt about the program. Most of these responses occurred after the ends of the study periods. We used these data to assess the ease of setting up and learning to use Health Buddy™, improvements in patients’ understanding of CHF, and patients’ attitudes towards Health Buddy™.

SETTING UP AND LEARNING TO USE THE HEALTH BUDDY™

The vast majority of patients who were asked reported that they found it easy to set up their Health Buddies™ and to learn to use them. For example, over 86 percent of respondents reported that they had no difficulty setting up the Health Buddy™ in their homes, and 92 percent took less than ten minutes to do so. Similarly large percentages of respondents reported that the instruction sets provided with or via the Health Buddy™ posed no difficulties.

PATIENT COMPLIANCE WITH HEALTH BUDDY™ SURVEYS

Failure of patients to respond to Health Buddy™ surveys may compromise patient outcomes and increase costs. While the Health Buddy™ is designed for daily contact with patients, a patient who only occasionally fails to respond may still be considered compliant. We therefore consider seven different compliance measures, namely the percentage of eligible days on which the patient’s latest response was (1) yesterday, (2) the day before yesterday, … (7) seven days ago. Days on which the patient was hospitalized were not counted as eligible for a patient response.

As Figure S.1 shows, compliance rates exceed the 80 percent figure previously reported [2] for a case management program that, like Health Buddy™, required patients to take the initiative in communicating with the case manager. Patients miss about one day in eight or ten on the average, but they rarely miss more than two or three days in a row.
Rates of compliance with long-term regimens tend to be lower than with short-term regimens [15]. We saw no tendency for compliance rates to decline over time. However, “long-term” generally means a year or more, and the study period at site A (which had the longer of the two periods) covers less than six months. Thus this result, while promising, is not definitive.

IMPROVEMENTS IN PATIENTS’ UNDERSTANDING AND MANAGEMENT OF THE DISEASE

The daily Health Buddy™ surveys included items intended to educate patients on how to care for themselves. Topics include medications (what do you take, and what is it for), diet (salt, sugar, alcohol, fat, cholesterol), monitoring oneself (weight, blood pressure, and symptoms such as shortness of breath or swelling in the tissues), and what your doctor needs to know.

From time to time a Health Buddy™ survey asked whether patients found items like these helpful. Almost all respondents said their diet compliance had gotten better or stayed the same since they received their Health Buddies™; only a handful reported that it had gotten worse. Patients also report that Health Buddy™ has a favorable effect on medication compliance. Most respondents report that participating in the program has given them a better understanding of their condition and
more confidence in taking care of it. A substantial minority thinks that what they have learned from the Health Buddy™ program has helped communication with their physicians.

These results must be interpreted with caution. These are self-reports, and people have been known to shade the truth about what they eat and drink, and whether they follow their doctor’s advice. It is clear that the “right” answer is “yes, I follow my diet,” and some patients may have answered this way in order not to disappoint their case manager. Moreover, patients had to recall their diet and medication compliance prior to Health Buddy™ several months after the fact, and their recollections about something as ordinary as eating must be subject to considerable uncertainty.

ATTITUDES TOWARDS THE USE OF HEALTH BUDDY™

More than 90 percent of respondents at both sites report that their experience with the program is positive, and they are likely or very likely to continue using the Health Buddy™. About 70 percent of respondents reported that they did not want any changes made to Health Buddy™, but this leaves 30 percent who said they did want something changed. Unfortunately, no attempt was made to determine what they wanted to change. Follow-up of the “change” question may yield ideas for improving Health Buddy™.

SUMMARY OBSERVATIONS

The Health Buddy™ serves its purpose well as a communication and data link between the patient at home and the case manager. However, it remains a work in progress. We believe it can be improved in several ways.

Case managers at the two beta sites have not consistently followed up with the few patients who consistently do not respond to surveys, so we suggest that Health Hero remind the case managers to do so. Perhaps some patients can be persuaded to set up and use the device, but if not, their Health Buddies™ can be recovered and refurbished for use by others.

Health Hero can improve questions about ease of using Health Buddy™, its effect on patient understanding and management of their
disease, and patient acceptance of the device. These questions are intended to identify shortcomings, on the basis of which Health Hero designs and implements improvements to Health Buddy™ protocols and surveys. Such questions will have greater utility if they are more concrete, focusing more on matters of fact and less on matters of judgement. The questions should also be less leading, and to the extent possible should not require patients to recall their behaviors from months before.

In this report we have considered patients' reports of how they use and benefit from Health Buddy™. But a complete assessment of a case management program depends on other factors as well. Is the case manager receiving the most useful information about the patient's signs and symptoms? Does she notify the patient’s physician on the appropriate occasions? Does the physician respond to notifications in the best way? Have patient outcomes (e.g., mortality, frequency and length of hospitalizations functional status, quality of life) improved?

Simply asking patients more or different survey questions will not be sufficient to evaluate these aspects of Health Buddy™. Rather, Health Hero will have to gather data from case managers, physicians, and possibly hospitals and insurers. Following up on this suggestion is more difficult, as it requires a partnership between Health Hero and its clients and perhaps with third parties as well.

Finally, we recommend that Health Hero keep a mindset of continual improvement. The literature on case management identifies substantial disagreements about how and how well case management programs work. Thus Health Hero is not simply providing a product or service for which there is generally agreed methodology. Health Hero needs to keep abreast of advances made by others in case management practice and theory, and they should seek to contribute their own advances by monitoring and continually improving the case management programs of which they are a part.