

VALUE: Virtual Assisted Living Umbrella for the Elderly – user patterns

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Abstract - VALUE is a randomized controlled trial to evaluate the impact of a home telehealth program on the ability of frail elderly individuals to remain living independently in their own home as their self-care abilities decline. VALUE uses broadband access to provide virtual visits with a home care nurse, a Web portal for ordering assisted living services, physiological monitoring, and access to the Internet. Subjects were able to use the VALUE program technology without difficulty after a brief instruction session with the nurse.

I. INTRODUCTION

Home telehealth uses telecommunications and information technology to enable or support health care delivery services directly in the patient's home. However, relatively few frail elderly living in houses or apartments have used this emerging technology to prevent the need for a move to a more restrictive environment, such as an assisted living (AL) facility or nursing home, as their self-care abilities wane. The National Center for Assisted Living (NCAL) estimates that there are currently 800,000 clients living in 33,000 AL residences despite the elderly generally preferring to remain in their own homes for as long as possible [1]. In two recent Minnesota surveys addressing the long-term care concerns of the elderly, 75% (Minneapolis Senior Survey, 2001) and 85% (AARP Minnesota Long Term Care Survey, 2003) respondents said that living independently in their own home is the most important issue for seniors. Thus there is a need for a cost-effective AL alternative that makes it possible for frail elderly to remain living independently in their own home as long as possible. VALUE (Virtual Assisted Living Umbrella for the Elderly) is a telehealth program utilizing videoconferencing, a Web-based ordering service portal, and physiological monitoring designed to deliver such an application to this population as an effective alternative to traditional AL service providers. This report focuses on the use of the ordering service portal by VALUE subjects.

II. METHODS

The VALUE study is a randomized controlled trial designed to compare the impact of telehealth services on elderly clients living independently in their own home (the intervention group) to a similar group of subjects obtaining needed supportive services by traditional means

(the control group), usually by telephone. Intervention subjects receive a VALUE workstation providing enhanced services consisting of virtual visits (VVs) with a project nurse using videoconferencing technology, broadband Internet access, a customized Web portal for ordering assisted living services, and physiological monitoring, as appropriate for the subjects' underlying health condition. Virtual visits consist of two-way audio and video interactions between the project nurse at the agency site and the subject at home.

The project provides the VALUE workstation consisting of a PC platform with a broadband (DSL or cable) connection, videoconferencing software (PVX PolyCom Inc, Pleasanton, CA, USA), and a web camera (QuickCam, Logitech, Fremont, CA, USA). PVX supports IP (Internet) videoconferencing using the improved H.264 video compression standard. Monitoring devices appropriate to the subject's health condition, such as blood pressure cuffs, pulse oximeters, spirometers (for lung function), glucometers, and scales are also a part of the VALUE program. The service portal is a customized Web tool developed for this assisted living application. It permits each subject to order frequently used services such as home delivered meals, transportation, health appointments, prescription refills, local merchant coupon books, and home chores with a few easy keystrokes, provides electronic communication with the subject's project nurse, and provides links to subject-relevant educational material on the Web. Subjects are also taught how to browse the Web for general health and consumer information and interactive games.

Focus groups were used to measure the "pulse" of the community regarding an Internet based program to extend independent living options for the elderly in informing the

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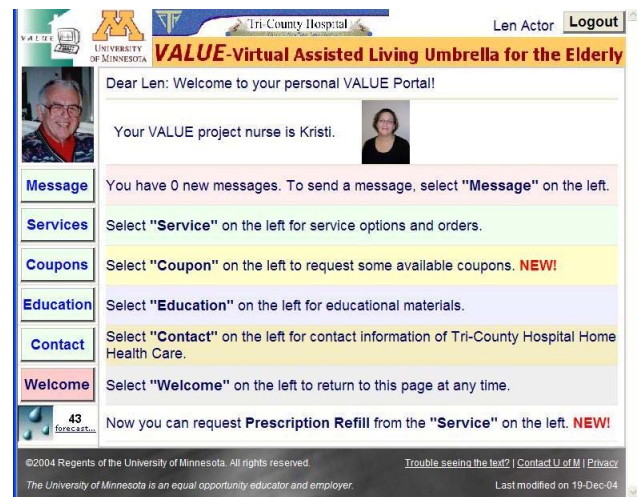
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VALUE design [2]. Participants thought that VALUE would be convenient, save time, and provide the opportunity for more frequent nurse contact, but they were concerned about learning to use the computer and Internet, possible hearing and vision problems, and cost. A pilot study then tested the usability of the VALUE home unit placed in subject homes. Pilot study participants satisfied the eligibility criteria for the full study, as described below. They were able to use the VALUE workstation, were satisfied with the service portal design and found the quality of virtual visits to be good.

There have been 80 subjects recruited through February 2006, of a goal of 100 subjects by the completion of the study. They were randomized into intervention and control groups at each site. Eligible subjects are at least 60 years old living independently in the community, managing one or more chronic conditions, are able to physically manipulate the system controls, can read and understand instructions, and have a telephone. Written informed consent was obtained from all participants, following the guidelines of the University of Minnesota IRB. Subjects are followed for a minimum of 6 months and maximum of 9 months, depending on when they are recruited relative to the study end date. Since the focus of this report is on the use of the ordering service portal which is available only to the intervention group, the 40 subjects in the intervention group will be considered. Usage reports will be presented for the most recent month of the study, with a focus on one week (February 27 to March 5, 2006) within this period. We believe this usage snapshot is more informative than a complete summary over the study period to date. During this review period, there were 25 subjects with broadband connections in place. The other intervention subjects were either discharged by this time, were newly recruited and not yet connected to the broadband service, were visiting away from home, or had dropped out of the study. There are 17 females and 8 males in the reporting group, with an average age of 80.3 years (6.6 yrs SD; range 62-93 yrs).

III. RESULTS

While the full study is not completed at this time, there are several preliminary results focused on patterns of use that are likely to carry over to the complete full study. The service portal design addresses the needs of frail elderly users regarding content, layout, font size, color, and navigation. It provides messaging, educational content, and scheduling for meals, transportation, house chores, medical/nurse appointments, drug refills, and ordering merchant coupons. The ordering portal home page is shown in Figure 1.



The merchant coupons were included as a non-health related activity to motivate subjects to practice using the portal for ordering services. All subjects were able to use the portal after a brief instructional session with the VALUE nurse. They accessed all portal functions without difficulty. There were 222 log-ins by 25 subjects during the week of interest. Five active subjects did not use the portal during that week for various reasons, including doctor's appointment (1), too tired (1), technical problems (2), and subject cancellation for unknown reason (1). Subjects used the portal for conducting virtual visits (20), to send or review messages to or from their VALUE project nurse (15), for ordering service activity (23), to access resource links provided by the VALUE staff (16), and to do general Web browsing. Messages generally fall into five categories, related to portal orders (8), scheduling virtual visits (2), health issues (1), training and testing (4), and other (0) for the specific reporting week. The weekly breakdown of activities were similar when averaged over the most recent reporting month, which had 230 average weekly log-ins. There was an average of 24 active subjects each week during this period. An average of 20 virtual visits were conducted weekly with these subjects. There were 13.5 average weekly messages, including 4.75 for portal order activity, 1.75 for virtual visits scheduling updates, 1.5 for health issues, 3.25 for training and testing, and 2.25 for other content. About 60% of the weekly messages originated from the subjects, and the remaining 40% were initiated by the nurse. Average weekly resource access included links to senior health topics (2.75), healthy aging (0.75), disease information (1.5), news and area resources (5.5) and personal interests (0.25). The focus week resource access was dominated by links to news and area resources (13) and no access to disease information or personal interests, demonstrating the variability in search usage by the study group. Although a detailed perception and satisfaction evaluation cannot be performed until the full study is concluded, initial impressions based on discussions and comments with both nurses and subjects suggest that the service objectives and technical quality of the program meets the expectations of the users.

IV. CONCLUSIONS

These studies demonstrate that frail elderly individuals are generally able to use the VALUE program technology without difficulty. This includes personal computer videoconferencing and use of a Web portal to send messages and request specific products and services. Previous studies have successfully used Plain Old Telephone Service (POTS) connectivity in home telehealth applications, but they have not provided the wide range of functions that becomes feasible with broadband [3-5]. To our knowledge, this is the first project to demonstrate feasibility of broadband Internet technologies to enable the elderly to remain in their homes. Unlike previously described dial-up Internet service or POTS-based telemonitoring, “always on” broadband Internet using a cable or DSL connection eliminates the need for the end user to learn how to connect to the Internet, permits high quality, encrypted videoconferencing, and allows high-speed Web-based interactions.

Some individuals who were eligible to participate did refuse because they were concerned about working with the equipment; others who expressed similar concerns but were willing to try VALUE found they were able to take part in virtual visits and portal use without any problems. The VALUE user interface was designed to address the needs of an elderly user group, particularly in terms of color, text density and size, and screen navigation [6].

The orders placed from the portal were primarily for the coupon offer and medication refills. The clients did not use the portal to order more conventional assisted living services during the review period. It may be due to the fact that they had pre-existing arrangements for obtaining these services and were not especially motivated to substitute a new ordering method for an existing one that was working for them. The orders for coupons and medication refills were new to most of the clients and their use may be a better indicator of the utility and desirability of the portal for new services.

Some concerns related to long term adoption of home telehealth programs like VALUE are related to the cost and access to broadband services, reimbursement policy and an appropriate business plan. Broadband access, while still limited in some geographic areas, is improving and it is likely that cost will decrease as the customer base increases. More supportive reimbursement policies are justified if randomized controlled trials such as VALUE can demonstrate the benefits attained by home telehealth compared to traditional means of providing care and services to a growing and more technically literate elderly population. Even within current reimbursement models, opportunities exist to move programs like VALUE from the research setting to the home health industry. Optimal patient populations for this type of home telehealth, ways

to integrate telehealth with other home health services and practical business models require further investigation.

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