

Promoting the Wellness Model of Elderly Health Care through Technology and Social Support

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Abstract - Within the next 20 years, the nation will be faced with increased pressure on its health care delivery mechanisms as the dramatic aging of our population becomes evident. Presently, two paradigms underlie efforts to maintain the health of the elderly. The first, a medical paradigm, is based on a 'crisis management' approach in which interventions are tried only if an individual's health is critically impaired. The second, a wellness paradigm based on prevention, intervenes to maintain a healthy state and avoid crisis. While both approaches use a combination of technology and social support, the medical paradigm focuses heavily on technology, while wellness interventions rely primarily on social support. This paper will explore wellness interventions that use technology to significantly enhance social support mechanisms, particularly in cases of social isolation arising from geographic distance, psychological state, or physical disability.

Introduction – The Problem

Our society is getting older. On January 1, 2011, the first of the 'baby boomers' will turn 65 years old. By 2023, roughly 20% of our nation will be over 65, giving us a look similar to Florida today.[1] This January 1, 2011, birthday marks the beginning of our nation's newest challenge: providing for a high quality of life for our elderly population without bringing the rest of us down.

The social implications of this demographic shift are profound. As people age, they change, both physically and mentally. Currently, the elderly are largely excluded from the workforce, some by choice, some by social expectations, but many others by physical or mental barriers. Many undergo significant lifestyle changes as these physical and mental changes increasingly reduce their ability to care for themselves, in areas ranging from driving or shopping, to dressing and feeding. These individuals must be cared for by others, either by family or through paid support.

The aging of the population will have significant economic and political implications that will affect the nature of our society and so of our national future. The elderly will be interested in funding and supporting different social programs than their middle-aged children will choose, changing the pattern of the federal budget. As they become less able to access information, their voting behaviors may change. Finally there is the cost of supporting the care and maintenance of this elderly population – a cost that will be borne by a workforce that is growing proportionally smaller in relationship to the supported population.

While we cannot stop chronological progression, we can have an impact on the physiological and associated psychological changes associated with chronological aging. We also can influence how we are socially organized to care for our elderly. This discussion will address an emergent model of care for the elderly that is based on a wellness rather than a medical paradigm of care. This new model will incorporate technology into social interventions and mechanisms of care for the elderly, significantly extending our ability to care for this cohort and improving the quality of care provided.

This paper will explore the wellness and medical models of care in a little greater depth, and then focus on wellness interventions that use technology to significantly enhance social support mechanisms and service delivery vehicles. We will concentrate on cases where technology is used in instances of social isolation arising from geographic distance, psychological state, or physical disability while recognizing that the suite of potential technologies and applications extends far beyond these limited cases. We also will explore some implications for service providers and the model as a whole of the addition of technology to the social support paradigm.

Paradigms Of Care

Presently, in our society, two paradigms underlie efforts to maintain the health of the elderly. One is a medical

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paradigm based on a crisis management approach. Under this model, interventions are effected only if an individual's health is critically impaired. Historically, the medical paradigm has focused almost exclusively on physiological aspects of health. An alternative approach is based on a wellness paradigm, in which attention is focused on *maintaining* health. This approach is based on prevention, intervening before deterioration has taken place to maintain a healthy state and avoid crisis. Wellness approaches traditionally have taken a holistic approach to care, considering psychological and social dimensions of health, in addition to the physiological.

For a variety of social and cultural reasons, the medical paradigm is dominant in our society today. This intervention model is heavily dependent on technology and is highly 'scientific' in its method, approach, and evaluation of results. The wellness paradigm is much less technology-dependent in its application. It relies much more on social support mechanisms than does the medical model and has traditionally been much less rigorous in its application of interventions and evaluation of results.

The Medical Model

The medical model is, as noted above, crisis-based and remediation-focused in its methodology, and biological in its tools and outlook. The model is based on certain assumptions: that there are certain physiological indicators of 'health'; that we know what those are; that we know how to measure them; we know the boundaries within which normal performance falls; we know the consequences of performance outside those normal bounds. From these assumptions comes the medical model of treatment. A patient presents here a complex of symptoms, a 'syndrome.' The medical community knows (albeit imperfectly) the relationship between certain symptoms or indicators and physiological malfunctioning. Measurements of these indicators are taken. Extrapolations are made to physiological function and a determination of the extent of malfunction. A chemical or physical (surgical) intervention is performed to bring functions back to the norm. Performance is evaluated by subsequent performance of those functions within the normal space, as determined through measurement.

Our national investment has been skewed toward payment for "fixing" problems. In their forward looking document, "MHS 2025 – Toward a New Enterprise", the military health system notes that "roughly 90% of the variance in illness and premature death is related to factors other than access to medical treatment. Yet 99% of out total investment in health goes to medical treatment. Public health, health promotion, and disease prevention receive only 1% of total funding." [2]

Note that, under a medical model, the goal of the activity is remediation (to 'fix' or correct something that is malfunctioning) and that action is only taken upon clear

indication of malfunction (the patient presents with symptoms/a syndrome). This is in clear contrast to a wellness model.

The Wellness Model

The wellness model is focused on prevention and maintenance rather than remediation, and tends to be crisis-avoidant in nature. There are many variations of a "wellness model" but the holistic nature of these approaches and the kinds of issues addressed are very similar. To give a flavor of these we will use the model described by one of the founders of the National Wellness Institute, Dr. Bill Hettler, who described the six dimensions of wellness as: social, occupational, spiritual, physical, intellectual, and emotional. [3]

Although wellness could be based solely on the establishment of baseline physiological indicators, patient psychological state (usually self-assessed) and an 'objective' assessment of social situation plays a much bigger role in interventions under a wellness model than under a medical model. Most wellness models recognize the impact of social context on psychological state and therefore on physiological health.

In the wellness as in the medical model, a baseline state is established. However, rather than be alerted and motivated to act by deviance from the baseline, the wellness model stimulates action that promotes *adherence* to the baseline, that is, that *prevents* the deviance that triggers the application of the medical model. Because most variants of the wellness model also explicitly recognize the impact of psychological state and social context on physiological health, treatment or intervention regimes are socially and psychologically as well as biologically based.

Technology And Wellness

The application of technology to the understanding and manipulation of biological systems is clear. Technology can be used to develop measuring devices to help us assess their functioning. It can be used to help us 'see the unseen'-things that are too small for the naked eye to see, or that manifest themselves in spectra or on frequencies that we are not equipped to detect. Technology also can be used to manipulate things or states humans cannot—surgical tools that allow precision insertions, for example, or chemicals that change physiological function. Medicine and technology have had a long and beneficial relationship.

Technology based or assisted solutions are much less prevalent in interventions deriving from a wellness model. The social and psychological dimensions of the wellness model emphasize the importance of the 'human touch' in interventions. Most interventions are provided by social

workers or others trained in the humanistic rather than the medical side of caregiving and social support. However, some efforts have been successful in trying to provide tools for the individual to use in assessing “wellness”. For an example, an online tool is available from the National Wellness Institute which is representative of this simple application of technology.

We suggest that there is a significant role for technology to play in the delivery of social support and other wellness interventions—that appropriately developed and deployed technologies can enhance rather than substitute for the human dimension of caregiving that is so important under a wellness paradigm. Technology can do this either by performing certain tasks that do not have or require a humanistic dimension such as routine monitoring of physical parameters or monitoring and record keeping, thus freeing caregivers for attention to more important social interactions, or by enhancing or expanding certain types of social interaction. Furthermore, we argue, given the pending shortage of labor as the elderly population increases relative to the caregiving population, such technological enhancement of human interaction will be imperative if the quality of life of the elderly is to be maintained.

While we contend that technology can improve the effectiveness of the wellness paradigm, we also recognize and caution about pitfalls that must be avoided. Though we can easily claim that information technology should be able to drastically reduce the costs, improve the quality and access to patient medical records and improve public health surveillance, little progress has been made in the last 10 years. In his book, Medicine and the Information Age, Dr. Jeffrey Rose remarks, “There are two fundamental barriers to reaping the benefits of widespread information system use in health care. ... First, it is difficult to fuse modern information technology culture with traditional business culture, let alone archetypal medical culture. ... The second difficulty lies in the fact that the product of the new technology, information, exceeds the willingness and ability of workers to cope with the real and perceived consequences of what can be discovered and evaluated.”[4] It is important to note that these barriers are really social and cultural in nature rather than technological. It is also true that while information technology should be able to lower costs of health care, many technology applications in the medical arena have led to increased costs. Once new medical technology is available, consumers often clamor for its use – even when there is little evidence of potential benefit and physicians tend to apply the latest technology even when benefit over other approaches is not apparent. Cost effectiveness is a difficult principle to apply when human suffering and lives are at stake. Thus, as new technologies are developed to enhance the effectiveness of the wellness approach in health care, care will need to be taken to assure that the technologies are cost effective and will not

interfere with the social and cultural strengths of the wellness paradigm.

Technology And The Caregiver

Technology can be used to perform certain tasks that do not need the ‘human touch’ that a caregiver provides. Use of technology in this way will free the caregiver to focus on ‘quality’ interaction, that is, on social interactions that can significantly enhance the quality of life of both the elderly and of the caregiver. Some examples follow.

Georgia Tech [5] is developing an ‘Aware Home’ that will incorporate some of these technologies. Non-intrusive tracking devices will monitor movement about the home to provide reassurance to caregivers without intrusive telephone calls or other contact with the resident.

A more extensive, commercially available example can be found in Elite Care [6] in Milwaukie, Oregon. Elite Care operates Oatfield Estates, an assisted living facility, in which an infrared system enables the computer network system to determine the location of each resident and caregiver. The all-electronic care records kept on the system are accessible in each room only to the appropriate personnel, determined automatically by the system’s knowledge of the personnel in the room. The movement of caregivers throughout the facility is noted, allowing for more accurate records of care actually delivered. Lighting and appliances are also computer controlled allowing for activation of proper lighting for each resident and for the deactivation of appliances that could harm residents with dementia. Sensors in the beds of residents allow an unobtrusive weight tracking of each resident and in combination with location data, allows for automatic calls for caregiver attention if a resident is not in bed during normal sleep times. Caregivers live with their families in this facility also, allowing for an extended family setting. The technology allows for fewer staff and more continuous presence of this smaller staff.

Additionally, the Palo Alto Veteran’s Administration (VA) Hospital has a grant to study the usefulness of presenting computer-mediated healthcare information to patients via kiosks in hospital waiting rooms and other public spaces. For example, the kiosks are placed in public spaces to allow patients to access health information from the 20 best health-related websites in the controlled environment of a touch screen kiosk. Patients will be able to refill their medication online at the kiosk, print health information, and fill out online surveys that will provide demographic information. The kiosk will also print vouchers for medical attention and will measure the patients’ compliance with following up on the recommended clinical care that is provided at the kiosk.

The Health Buddy (developed by Health Hero Network) is another technology product being evaluated

by the VA [7]. The Health Buddy is a tabletop device about the size of a caller ID box that serves to connect patients with their caregivers. Caregivers and patients are able to "converse" in real-time or asynchronously about a patient's progress. The caregiver on a regular basis reviews a web-enabled database on the patient's progress and later any relevant changes in progress are communicated to the primary care physician. Health Buddy features a very simple interface that is easy to use. Trends the VA Hospital has noticed from patients using the Health Buddy include reduced hospital visits, increased access to veterans in rural areas to services, increased provider satisfaction, increased patient satisfaction, reduced medication use, enhanced patient education, improved self-management, and improved acceptance of technology. Patients are provided a Health Buddy tailored for their special needs. Health Hero Network has a number of Health Buddies for measuring stress, anxiety, diabetes, lung disease, heart disease, and more.

Finally, telemedicine in its many variants also fits into this category. Distance consultation already is a reality, precluding fatiguing journeys for the elderly, freeing up escort or support personnel and services, and providing access to a broad range of expertise particularly for those living in geographically remote areas. Advances in haptics and robotics are bringing the notion of remotely performed surgery into the realm of possibility. [8]

Technology And The Elderly

Technology can be used directly by the elderly to enhance mental well-being and expand social engagement. This follows the wellness paradigm which assumes that quality of life as well as physiological well-being will be enhanced through social stimulation and mental stability. Technology can contribute in this arena through current-day applications such as email and chat rooms, as well as more advanced applications such as e-sage-ing and remote relationships. It seems that this kind of technology can enhance one's ability to engage in life experiences. Generations Online is an online independent learning environment that promotes computer-mediated intergenerational communication [9]. In the mini-browser environment, seniors learn to use a mouse, surf the Internet, search the WWW, and communicate asynchronously with 8 to 10 year-olds on the subject of memories. The asynchronous bulletin board allows seniors and kids to post questions and answers about the past. The interaction between the kids and the seniors becomes part of the classroom curriculum.

E-sage-ing, on the other hand, is a real time discovery process that can occur between kids and elderly in an electronic environment. The term "sage-ing" was coined by Zalman Schachter-Shalomi and refers to a new model of late-life development enabling older people to

become spiritually radiant, physically vital and socially responsible "elders of the tribe" [10]. E-sage-ing is the intergenerational discovery process that can occur in an electronic environment in which E-sage-ers engage in storytelling, creativity, exploration, and friendship. [11] In particular, e-sage-ing can be a mechanism for elderly and disabled who are homebound, to communicate with latchkey kids. In this sense, electronic communication may foster healthy intergenerational relationships built on respect, friendship, and care. The authors believe that the contributions of elderly who are immobile and "homebound," or persons with disabilities, could be facilitated by recent advancements in communications technology. We believe it is necessary to explore how computer-mediated communication and social computing create new avenues to further human interaction across distance, ability, and cultural identity. We propose that lifelong contribution to society may be enabled by electronic communication in an intergenerational workplace, home, and community. E-sage-ing could contribute to the process of Successful Aging by reducing social isolation of the elderly, disabled, and young, such as latchkey kids, who are often left alone while their parent(s) work(s). In addition, each party contributing to these interactions has the potential to add value to society though teaching, learning, discovering, exploring, caring, and mentoring.

Another example of technology contributing to wellness can be seen in the work of Dr. Dave Warner of the Institute for Interventional Informatics [12]. In one of his many applications for the disabled he used a remote controlled toy car, equipped with camera, to allow a severely disabled child to "play" with friends in his home, even though he was confined to bed [13]. The child's friends played with the car and while he controlled the car and viewed the activity with the friends using the "vision" provided by the camera on the car. One can imagine such a device allowing an aging grandparent to remotely interact with and monitor the activities of a grandchild.

Technology also can provide a means for the individual to monitor his or her own health, promoting adherence to drug and exercise regimes and alerting the individual as well as caregivers when physiological indicators show significant deviance from established baselines. There are many products coming on the market today to enable just this kind of personal monitoring. By way of example, a website offered by BodyMedia, Inc. [14] allows individuals to enter data about their physiological state and mental state and then provides feedback on their total health status. Wearable monitors to collect much of this data directly from individuals will be available for their customers later this year and will allow download of the data to their site for analysis. Currently, some health clubs have their exercise equipment networked allowing clients who "sign in" at each piece of equipment to track their progress in a given session and compare to previous sessions. This can serve

as a motivational tool to follow a prescribed exercise program. In the future, perhaps we can have monetary incentives through lower insurance rates for medical insurance where technology could be used to monitor and document adherence to a healthy regimen. As these technologies begin to be developed with the aging population in mind and as new funding policies are introduced to encourage their application, fundamental changes in human behavior could be possible. This can have a profound effect on the health of our much older population of the future.

Technology And Society

There is an interesting—and rather profound—larger social dimension to the integration of technology into the wellness paradigm. Historically, the training of social support and technology-literate workers have followed different institutional and programmatic tracks. Engineers who design the wearables intended to allow the elderly to monitor their own health traditionally have had little training in the psychology of dependency and other areas of geriatric social work that might influence the elderly's use of the devices and interpretation of the results. Conversely, those trained in social support vehicles and delivery mechanisms generally have a low level of awareness of technologies available to enhance interactions and a little training in use or repair of such devices. Education for the social worker of the future has begun to incorporate more emphasis on gerontology in response to the expected growth in the elder population but the need for more cross training in technology literacy has not yet been identified.

We envision a broad use of technology under the wellness model in the future which will require significant re-conceptualization of the skills a caregiver needs, and a consequent re-tooling of education and training regimes. If we want to avoid the lessons of the past with the difficult infusion of information technologies into the medical community, we must work now to provide more cross-disciplinary education to allow technological tools to be properly developed for sociological solutions. This kind of cross-cultural understanding is very difficult because the methods used by the sociologic and technologic communities are based on different values and use different languages. However, the potential for good is so great, we must strive to make these partnerships work.

Summary

Our society is getting older. Many concerns have been raised about the quality of life available for what will become a large percentage of our population. These

concerns grow particularly critical as we face the possible care of a large elderly population by a workforce that is growing proportionally smaller in relationship to the population it must support. Many societal changes will be required to properly address these problems but technology can also help solve these problems. However, in order to properly insert technology into the caregiving model, we will need to change the way in which technology is developed and deployed and we will need to change the way we think about caregiving and caregivers.

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