

Telemedicine Helping Older Adults in Managing Chronic Illness

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The Problem

The goal of 'health for all' was adopted by the assembly of nations attending the 1978 World Health Organization's conference on primary care in Alma Ata. While initially directed toward lesser developed countries, it was expanded to all countries five years later. The Alma Ata Declaration affirmed that universal access to "essential health care based on practical, scientifically sound, and socially acceptable methods and technology" would achieve this goal by the year 2000, and that "people have a right and a duty to participate individually and collectively in the planning and implementation of their health care." Today, few, if any, would argue that these goals have been accomplished anywhere. Indeed, health systems worldwide continue to grapple with three seemingly intransigent problems preventing this achievement, (1) inequity of access to health care resources due to residential location, ability to pay, as well as social and cultural factors; (2) uneven distribution of quality health care due to location decisions by providers and practice patterns; and (3) unabated cost inflation resulting from scientific and technological advances, medical specialization, and increased demand for medical services.

The aging of the population and the attendant increase in the prevalence of chronic illness among them have exacerbated all three problem areas. Differences in equity and quality of health care continue because of the inability to resolve the discrepancy between the locations of medical resources vis-à-vis those requiring care. Generally, medical specialists tend to locate in large population centers where they can draw sufficient patient volumes to support their practices and also be in proximity to specialized medical centers.

The factors contributing to cost inflation are complex, including scientific/technological advances that improve health and longevity. Health care expenditures as a percentage of Gross Domestic Product have increased from about 5% in the 1960s to about 17.8% in 2015, reaching about \$3.2 trillion or \$9,990 per capita. Indeed, many health care professionals and policy makers have expressed concern that the U.S. health system is on a non-sustainable course unless significant corrective action is taken, but there is also disagreement as to the optimal solutions. Nonetheless, it is widely recognized that we need to improve the organization, financing, and delivery of health care in substantive ways that improve efficiency, productivity, and integration of health services, as well as diminish reliance on

expensive medical interventions. One prominent target is the tele-management of chronic illness among older adults.

Older adults (65 years of age and older) constitute a growing segment of the population in the U.S. and elsewhere, due to prolonged life expectancy and lower birth rates. Compared to its counterparts, this segment continues to incur a heavier share in all three problem areas noted above, especially cost inflation. In 2015, older adults comprised 14.5% of the U.S. population, and projected to be 21.7% in 2040; 10% were living below the poverty level. They have assumed a disproportionately larger share in the use of health resources. For example, their rate of hospital stays was twice as that of the general population; 20% had outpatient visits in 2014, compared to 13% among those 45-64. More than one third (or 36%) had some type of disability.

Three out of four Americans aged 65 and older have multiple chronic conditions (CDC, 2016), e.g. arthritis 49%, heart disease 30%, cancer 24%, diabetes 21%, hypertension 71%. Overall, 70% of all deaths are from chronic diseases; 50% from heart disease, cancer and stroke. In terms of cost, 70% of all health care expenditures are spent on chronic illness [1]. More relevant to the subject at hand, the care that older adults receive for managing chronic illness is sub-optimal, due to several factors, notably: (1) provider-centered practice arrangements in chronic disease management, (2) insufficient attention to patient engagement in their own care and informed decision making, and (3) the prevalence of unhealthy life styles and medication non-compliance.

Clinical practice is organized primarily around the availability/convenience of the provider, not necessarily patient need. Return visits are scheduled at fixed interludes mostly at arbitrary intervals, whereas symptoms may occur or become exacerbated abruptly at unpredictable times. When this occurs, patients are often advised to go to an emergency department (ED), where care is readily available, usually comprehensive, but also expensive and potentially discontinuous. The ED has become the catch-all destination and a revolving door for sub-optimal chronic disease management.

Whereas the concept of 'patient-centered care' has been widely advocated by policymakers, health providers and payers, the formal mechanisms and structures for its actual implementation are still lagging behind. In particular, chronically ill patients must have the appropriate tools and active support system to recognize the significance of their symptoms, the trend over time, and the appropriate steps and choices to be

made for relief. Patients cannot be expected to assume a more active role in managing their own care without having direct access to and understanding of current, accurate, and relevant information about their health situation, the seriousness of their symptoms and effective ways of dealing with them.

Finally, patients of all ages, especially older adults, must be encouraged and supported to assume greater responsibility for managing their own health and health care, including (a) the adoption of healthy life styles to mitigate, if not prevent, chronic diseases, reduce pre-mature death, and diminish reliance on the health system; (b) compliance with prescribed medication regimens and treatment to avoid adverse events and ineffective dosage, and (c) symptom recognition and severity assessment to assure appropriate use of service. Indeed, the failure to achieve optimal levels of population health, including older adults, cannot be accounted for solely by the quality or effectiveness of the prevailing health system. Numerous examples attest to the importance of patient behavior in this regard.

For example, while smoking continues to be the leading cause of preventable death:

1. A significant percentage of adults continue to smoke (17% of those between 45 and 65), and 8.4% of those 65 and older, more among men than women.

2. Higher disability is observed among smokers than non-smokers, overall (21.5% vs.13%).

Overweight and obesity:

1. More than two-thirds of adults (68.8%) of adults in the US are overweight or obese; more than one-third (38.5%) of adults over 60 years of age are obese.

2. Obesity and overweight are the second leading cause of preventable death. An estimated 300,000 deaths per year are due to obesity.

Medication non-adherence:

1. Medication non-adherence is multi-faceted, including medications prescribed but not taken, taken but not prescribed, not taken properly in terms of dosage and duration, and not reporting adverse reactions.

2. Overall estimates of medication non-adherence vary widely, from 30% to 60%, typically higher among older patients (80+) and younger than 55, those with longer term dosages, and those with higher drug dosage.

The Solution

The wide adoption of the electronic medical record (EMR) (stipulated by HITECH Act of 2009, Meaningful use) has had a positive yet modest effect on the coordination and continuity of care, however, is unrelated to other dimensions of care, including access. Thus, while the EMR was a step in the right direction, the larger problems resulting from the aging of the population, increased incidence of chronic diseases, persistence of unhealthy life styles, and over-reliance on medical care have

persisted. Without completing the cycle that employs the full capabilities of information and communication technology in health care, the EMR as an end in itself may simply be adding to the cost of care without contributing to those changes necessary and fundamental to improving access to care, enhancing quality and containing cost or to activating patients in adopting healthy life styles.

The solution focusses on telemedicine, an innovative and maturing system that simultaneously has demonstrated potential to address all three intransigent problems of limited access to care, uneven distribution of quality and cost inflation, and its unique role in serving the health care needs of older adults with chronic illness. Following a brief definition of telemedicine, the specific rationale and attributes for this intervention are presented, as they apply to the management of chronic illness among older adults.

With increasing implementation across the spectrum of health care, telemedicine nomenclature continues to proliferate, to wit, telehealth, e-health (for electronic health) m-health (for mobile health), c-health (for connected health), and u-health (for ubiquitous health). Essentially, telemedicine is best thought of as a system of care that relies on information and communication technology to acquire, store, process, retrieve and exchange information in various modalities of care delivery. Its goal is undifferentiated from that of health care in general, namely to promote health and prevent disease, treat the sick, rehabilitate the infirm and disabled, alleviate pain and suffering, as well as provide support at the end of life. As such, telemedicine constitutes an increasingly accepted option to meet the health care needs of a growing segment of the population while simultaneously addressing and reining in associated health care costs. This can be accomplished through connectivity, continuity, patient engagement, informed decision making, patient-centered care and positive health behavior.

Connectivity

The tools of telemedicine enable interaction and information exchange between patients and providers regardless of time and distance barriers in either real time or 'store-and-forward' modes. These interactions include continuous monitoring of older adults while living at home, including the collection of vital data, symptoms, and compliance with medication regimens as well as responding to questions and inquiries. The underlying information and communication technology (ICT) has become a necessary and prominent feature in all sectors of modern society, including education, commerce, transportation, banking, entertainment, and of course health care. It is ubiquitous, versatile, user-friendly, and affordable.

Continuity of Care

Telemedicine systems are typically established as networks, some as hub-and-spoke and others as virtual networks involving participants in various locations connected electronically. The use of the EMR assures ready availability of patient medical history, allergies, medications, test results, etc. for all providers

within a participating network. This constitutes a critical foundation for continuity of care.

Patient Engagement

The continuous availability and access to information exchange between a regular source of care, typically staffed by advanced practice providers (nurse practitioners or physician assistants with physician supervision) are managed through established protocols that provide patients with explicit guides concerning medication compliance, a variety of health behaviors tailored to each patient, as well provider assistance on an “as necessary” basis. This assures patient engagement in a variety of activities, including regular reporting of relevant information, all aimed at minimizing symptom exacerbations and avoiding complications.

Patient-Centered Care Medical Home

Patient connectivity, continuity and engagement can be enhanced simultaneously in the “medical home,” also known as the patient-centered medical home, a team-based health care delivery system led by and under the direction of a health care provider. It is intended to provide comprehensive and continuous medical care to patients with a goal of realizing maximized health outcomes. This concept involves the coordination of treatment (and chronic care management) so that the patients receive the necessary, appropriate and comprehensive care where and when they need it in a manner they understand.

Positive Health Behavior

This is a critical component of the proposed system. Patients are provided information and incentives to maintain a healthy life style, commensurate with their current practices. This would

include smoking cessation, moderate alcohol intake, balanced diet, exercise, and compliance with prescribed regimen. Periodic or as necessary relevant behavior assessments and educational modules are personally or electronically provided.

Informed Decision-Making

Informed decision-making refers, in part, to an educated and informed consent process. Traditionally in an outpatient setting, patients are provided relevant information regarding the nature of the decision to be made in their treatment, available alternatives, risks and benefits, related uncertainties an assessment of their understanding and eliciting patient preference. This is especially pertinent when symptoms of chronic illness call for more invasive procedures.

A comprehensive solution must address most, if not all, of these issues in a coherent and integrated manner. Past experience has demonstrated that partial steps can only lead to partial solutions, while the problems continue to grow and proliferate. Evidence-based positive benefits of telemedicine intervention/management have been identified for heart disease, stroke, chronic obstructive pulmonary disease, mental health, dermatology, radiology and pathology. Thus, the telemedicine solution, if implemented properly, has the demonstrated potential to address the plethora of issues fundamental to managing chronic conditions of older populations through improving timely access and quality of care, reducing unnecessary clinic visits, and supporting positive health behavior in an efficient and effective manner, and, thereby containing costs.

References

1. These data are available in more detail on the website of the U.S. Department of Health and Human Services, Administration on Aging.