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Fraser Health Authority, Canada
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Using an Electronic Comprehensive Geriatric Assessment and Health Coaching to Prevent Frailty in Primary Care: The CARES Model

Antonina Garm[1], Grace H Park[2] and Xiaowei Song[3*]

[1]CARES Program, Fraser Health, Suite 500, Central City Tower, 13450 102 Avenue Surrey, British Columbia V3T 0H1, Canada

[2]Primary Health Care, Fraser Health, 101A 2099 152 street, Surrey, British Columbia V4A 4N7, Canada

[3]Health Sciences and Innovation, Fraser Health, Surrey Memorial Hospital, 13750 96th Avenue Surrey, British Columbia V3V 1Z2, Canada

[*]**Corresponding author:** Song X, PhD, MSCS, Health Sciences and Innovation, Fraser Health, Surrey Memorial Hospital, 13750 96th Avenue Surrey, British Columbia V3V 1Z2, Canada, Tel: 1-604-585-5666; E-mail: xiaowei.song@fraserhealth.ca

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Abstract

Frailty threatens the quality of life of seniors. As the leading cause for the disproportionate use of health care resources, frailty is a serious threat to the sustainability of the health care system. Mounting evidence suggests frailty can be prevented with early assessment and management. Primary care providers are well positioned to identify "at risk" seniors and enact care plans to prevent frailty from progressing. The Comprehensive Geriatric Assessment (CGA) has repeatedly demonstrated value in the clinical setting for enhanced outcomes for seniors. The Frailty Index (FI) is a reliable and sensitive measure of frailty that can be generated from the CGA (FI-CGA). Implementing the FI-CGA into the electronic medical records of primary care can enable the use of a reliable and valid measurement of frailty at point of service. Using the electronic FI-CGA in the clinic setting guides healthcare providers to make more meaningful and comprehensive healthcare decisions. Based on the degree of frailty, health coaching aims to both support the seniors competence in their self-management as well the adoption of health promoting behaviors like exercise and improved nutritional choices. The Community Actions and Resources Empowering Seniors (CARES) collaborative model in primary care aims to provide substantial healthcare cost savings over time by addressing frailty at early stages and decreasing costly hospital admissions. CARES further aims to improve the quality of life of seniors by generating a sense of empowerment and control over their risk for frailty through health coaching to adopt healthy aging strategies.

Keywords: CARES model; Electronic comprehensive geriatric assessment; Frailty; Frailty index; Older adults; Primary care

Introduction

The world's population continues to age at an unprecedented rate: in 2016, 8.5% of people worldwide are aged 65 and over, which is projected to reach 17% by 2050 [1]. Older adults, especially those who are frail, often have multiple interacting medical and social problems and are at greater risk for death and other adverse events [2]. Frailty refers to a state of vulnerability and diminished physiological reserve that impedes the body's ability to withstand and recover from minor challenges [2,3]. In the frail senior, reserve and function are diminished across multiple physiological systems and the ability to cope with every day or acute stressors is compromised [3]. This makes their health care complex and expensive, leading to disproportionate use of the health care resources [4]. It is reported that many seniors with multiple co-morbid health issues spend the last 8-10 years of their life suffering from the impact of frailty on their health [4].

Accurate and early assessment of frailty is crucial for effective care management and curbing of possible preventable health decline. Mounting evidence suggests frailty may be modifiable and can be prevented and sometimes even reversed [5]. Emerging frailty guidelines recommend the early identification of frailty in "at risk" seniors to address modifiable variables and prevent deterioration before it occurs [6,7]. The recognition for frailty is important especially in the primary care setting [8-10]. A seemingly small medical event, for example; an infection, constipation and medication change, may trigger a dramatic change in the physical and mental wellbeing of an individual. As frailty increases, the adverse consequences for the individual may be severe resulting in hospitalization, institutionalization or even death [8,9]. Primary care clinicians can take patients' lifestyle and social context into consideration for early management. Even so, frailty prevention has not been a part of standard care of primary care, while valid and clinically useful tools for early identification of frailty are in demand [10].

Frailty assessment

Frailty can be operationalized in many ways and several methods have been commonly used to assess frailty [11-12]. The Frailty Phenotype views frailty as a syndrome defined by five specific criteria; older adults who meet at least three of the criteria are "frail", while those who show none of the five criteria

are considered as "robust" [13]. The Clinical Frailty Scale classifies frailty into nine categories ranging from very fit to terminally ill in determining frailty [14]. The deficit accumulation based Frailty Index (FI) allows a more precise measurement of frailty and has gained increasing popularity [15,16]. The FI evaluates the extent to which deficits are accumulated with age in a given person, calculated as a proportional count of how many health problems an individual has (i.e. level of frailty increases proportionally as the number of health deficits increases) [15,16]. The underlying mechanisms of deficit accumulation suggest that there is a critical threshold of age-related decline in multiple physiological systems, beyond which deficits start to accumulate, resulting in poor health [3,17]. The FI has been validated by researchers around the world with multiple studies, applied to population-based and clinical settings alike with diverse outcomes [18-24].

The FI can be calculated using items from the standard Comprehensive Geriatric Assessment (CGA) [25,26]. The CGA is a systematic multidimensional information gathering approach for the assessment of older adults [27-32]. It includes redundant assessment items of multiple domains of cognition, emotion, motivation, health attitude, communication, sleep, pain, control of life, strength, balance, mobility, activities and instrumental activities of daily living, social engagement, and medication intake. Based on the comprehensive understanding of the overall health status of the older patients, health care professionals can develop a bird's eye view of complex patients and generate a problem list and appropriate care plans [27-32]. The FI-CGA was initiated by both using data from a standardized CGA and data derived from the clinical examination of a population-based study [25,26]. The FI-CGA correlated highly with an empirical FI and was associated with higher risk of death and institutionalization. The FI-CGA has also been used to study older patients in acute care settings in relation to the risk of death, length of stay and discharge destination [33]. A FI-CGA using a CGA-based questionnaire that can be completed by care partners has also been assessed as valid [34]. More recently, the FI-CGA has been used to assess frailty in older people in China and in hospitalized patients in geriatric wards [35,36].

The CARES Model

With the current situation for seniors and health care costs being unsustainable, a preventative approach to frailty management is needed to face the challenges. In 2016, the Fraser Health Authority in Canada addressed the need to develop a frailty prevention/management approach by piloting a novel project aimed at reducing the impact of frailty on 'at risk' seniors. The project is called the Community Action and Resources Empowering Seniors (CARES; **Figure 1**), which is based on research evidence that frailty can be delayed and potentially prevented outright [5,37]. The CARES program is a four step evidence-based initiative that decreases the impact of frailty on health resources while promoting healthy aging [38,39]. It partners with primary care physicians and early frail seniors health coaches to prevent frailty and support healthy aging for seniors "at risk" for frailty.
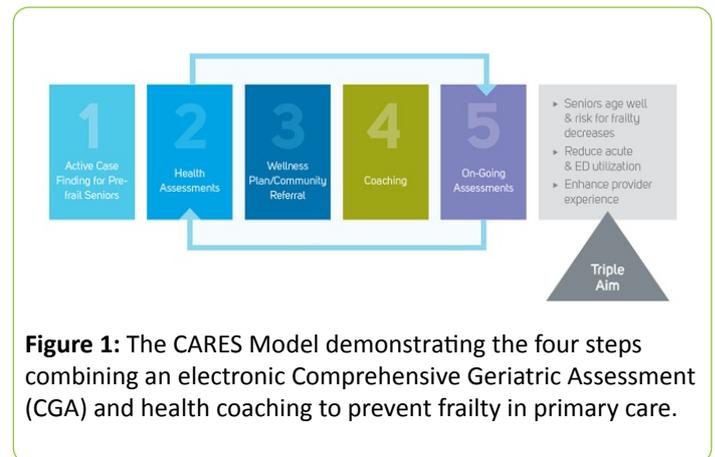

Figure 1: The CARES Model demonstrating the four steps combining an electronic Comprehensive Geriatric Assessment (CGA) and health coaching to prevent frailty in primary care.

As depicted in **Figure 1**, the first step of the CARES model has the primary care providers identify seniors 65-85 years of age living at home or in an assisted living setting with a Clinical Frailty Score between 3 and 6 (managing well; vulnerable; mildly frail; moderately frail), who are vulnerable to decline into frailty [14]. The second step of the CARES model has the primary care team completed an electronic comprehensive geriatric health assessment capable of generating a Frailty Index at point of service to assess the seniors' frailty level (**Figure 2**).

The third step uses the Frailty Index (FI) to inform the creation of a senior's individualized care plan. The intention of the plan is to identify goals most important to the senior participants that enhance their health and quality of life. The fourth step involves collaborators in the community who provide support to the senior to adhere to their care plan. In the CARES model these are health coaches, provided free to seniors through Self-Management BC.

A telephone based health coach is paired with the senior to track the participants' progress for up to six months as the patient works to adopt health protective behaviors which support development in exercise, nutrition and social engagement. Health coaching provides support to develop the senior's self-management capacity while providing education and facilitating connections to resources in the community. At the end of six months, the electronic FI-CGA health assessment is repeated and compared to baseline to monitor the senior's progression toward or away from frailty.

Proof of concept findings

The initial results of the CARES proof of concept pilot evaluation suggest it may be possible to slow the progression of frailty. In the preliminary study, there was a statistically significant decrease in the FI-CGA score of participating seniors (**Figure 3**). On average, the senior's frailty index score - from the baseline CGA to the 6-month post CGA - decreased by 0.032 [38,39]. These pilot data inspired Fraser Health to spread their CARES model proof of concept into other communities. Evidence demonstrates that early identification of 'at risk', seniors followed by comprehensive community geriatric health assessments and health coaching is associated with better health outcomes for this cohort of early frail seniors.
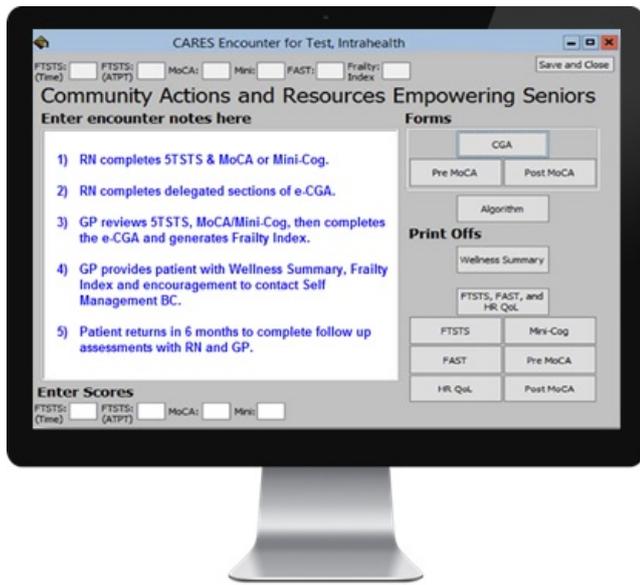
Figure 2: The computer interface for completing the Comprehensive Geriatric Assessment with automatic calculation of the electronic Comprehensive Geriatric Assessment/Frailty Index (eFI-CGA).

Working with the Divisions of Family Practice, Self-Management BC and local primary care clinics, CARES has launched its approach into other communities for further study and evaluation. To support adoption into the primary care setting, CARES assists with physician/ nurse practitioner frailty education and installment of the electronic format of the FI-CGA into the electronic medical records **(Figure 2)**. With the electronic FI-CGA embedded into EMRs, physicians and Nurse Practitioners are now able to generate a frailty index at the point of service. CARES supports primary care teams with the FI-CGA education and adoption as well as facilitates patients' access to free health coaching in the community to address the self-management capacity of their chronic health risks and conditions.

The electronic FI-CGA is now available to any Physician or Nurse Practitioner in primary care in BC who has access to the Intrahealth Profile electronic medical record. The collaborative CARES model is available to any community of primary care providers who have access to Intrahealth Profile and are interested in pursuing the full model. Ongoing research in collaboration with the world's leading experts on aging and frailty is to establish its reliability and validity for widespread use, and to extend its use beyond primary care and family medicine to other healthcare settings.

Discussion – Innovative models for care for older adults

In the CARES model, initial primary care education is focused on frailty and on the value of early frailty identification using electronic FI-CGA as the evidenced based assessment tool. Comprehensive Geriatric Assessment (CGA) is a well-established clinical tool used to determine older adults' medical,

psychosocial and functional capabilities [27-30]. It provides key baseline data for identifying degrees of risk and establishing individual care plans [31-32]. Proven benefits for patients include the preservation of physical function, maintenance of community living status and shorter stays and fewer admissions to hospitalization [27-32]. A deficit accumulation based frailty index can be calculated using CGA items. Using the eCGA to automatically determine electronic FI-CGA scores, healthcare practitioners are able to conveniently examine changes (including improvement) in the FI and encourage patients to develop self-care plans. As the key to care planning, the electronic FI-CGA precisely measures the level of frailty, providing evidence based cost-effective solution for large-scale application [40,41].
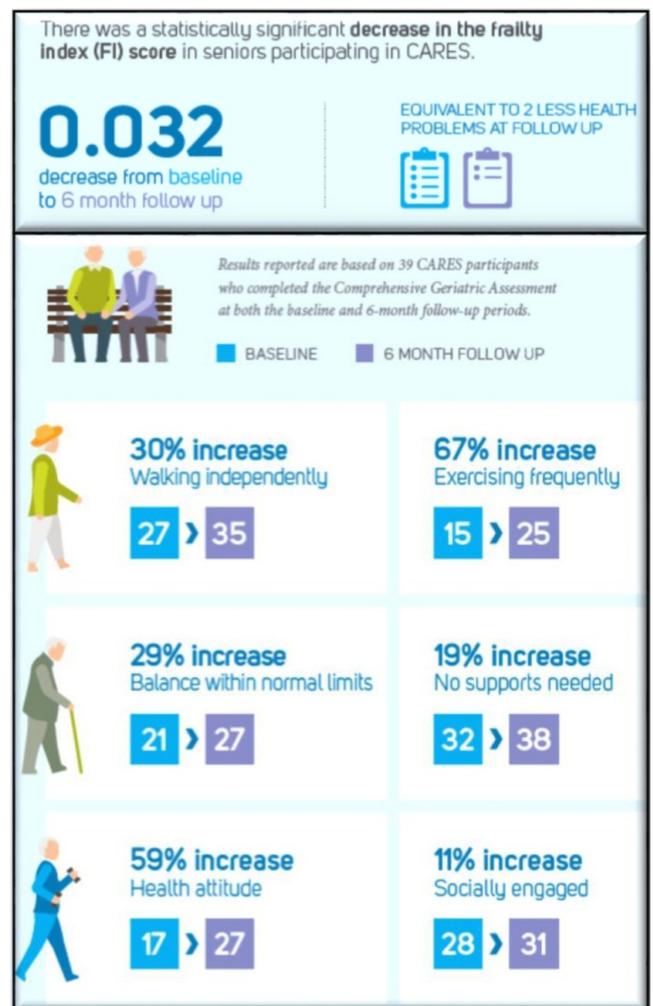

Figure 3: Preliminary data from pilot CARES study showing decreased levels of frailty as assessed using a Comprehensive Geriatric Assessment (CGA) based Frailty Index (FI-CGA) and increased levels of functionality through health coaching based health management.

Consistent with recommendations from frailty experts, the electronic FI-CGA result is used by the primary care provider to draft an individualized care plan for the senior based on what is most important to them. With care plan in hand, seniors contact

their health coaches by phone to begin regular health coaching to improve their compliance to a self-created plan that includes exercise, nutrition and social engagement. The Self-Management BC free telephone based health coaching model is a creation of the University of Victoria Institute on Aging and Lifelong Health. Because it is phone-based, coaching is available to any participant who has a phone despite their location.

Taken together, by using an evidenced based tool like the electronic FI-CGA in primary care setting, CARES aims to help healthcare providers make more meaningful and comprehensive healthcare decisions. These informed decisions improve patients' clinical outcomes and self-management competence leading to improving quality of life and reducing future costly hospital admissions and prolonged stays [42,43]. These do so precisely because they target frailty development before it becomes a serious issue for the patient. By creating individualized health care plans and referral to health coaching, CARES aims to support self-management capacity in "at risk" patients and support their health by engaging them in demonstrated health protective behaviors.

Conclusion

Implementing the electronic FI-CGA into the electronic medical records of primary care supports the use of a reliable and valid measurement of frailty at point of service. Using the electronic FI-CGA in the clinic setting guides healthcare providers to make more meaningful and comprehensive healthcare decisions, which in turn improve patients' clinical outcomes. Post FI-CGA health coaching aims to both support the senior's competence in their self-management as well the adoption of health promoting behaviors like exercise, improved nutritional choices while helping the senior to navigate their community resources. The CARES collaborative model in primary care demonstrates healthcare cost savings over time by addressing frailty at an early stage, avoiding costly hospital admissions. It further promises improving the quality of life of seniors by generating a sense of empowerment and control over their risk for frailty through exercise, nutrition and social engagement making their final years of life with chronic conditions more tolerable and enjoyable. Ultimately, it is anticipated CARES will be part of a larger strategy that provides real alternatives for patients at risk for frailty and support them to age well and enjoy the benefits of a healthier life lived out in their communities.

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Conflict of Interest

The authors have no conflict of interest with this work.

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