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Feature Article

The effect of a "surveillance nurse" telephone support intervention in a home care program

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ABSTRACT

This study is an evaluation of a unique "surveillance nurse" telephone support intervention for community-dwelling elderly individuals in a home care program. A combined propensity-based covariate-matching procedure was used to pair each individual who received the intervention ("treatment" condition, $n_T = 930$) to a similar individual who did not receive the intervention ("control" condition, $n_{C1} = 930$) from among a large pool of potential control individuals ($n_{C0} = 4656$). The intervention consisted of regularly scheduled telephone calls from a surveillance nurse to proactively assess the individual's well-being, care plan status, use of and need for services (home support, adult day program, physiotherapy, etc.) and home environment (e.g., informal caregiver support). Treatment and control conditions were compared with respect to four service utilization outcomes: (1) rate of survival in the community before institutionalization in an assisted living or nursing home facility or death, (2) rate of emergency room registrations, (3) rate of acute care hospitalizations, and (4) rate of days in hospital, during home care enrollment. Results indicated a beneficial effect of the surveillance nurse intervention on reducing rate of service utilization by increasing the duration of the home care episode.

Introduction and background

Health care systems in North America are confronted with three unyielding realities: (1) a shift in age demographics toward an older population, (2) financial pressures that require health care systems to maintain or expand program capacity while holding or even reducing costs, and (3) the phenomenon that older adults are disproportionate users of health care system resources, with greater risks of mortality and higher rates of multimorbidity. In the Canadian Province of British Columbia (BC) for example, the total number of individuals aged 65 years and older is currently estimated at over 750,000.[1] As a percentage of total population, this age group has grown steadily in BC over the past 40 years, from 9.3% (1971), to 11.6% (1985), to 13.1% (2000), to its current level of 16.9%. It is projected that by 2036, almost 25% of the population of the province, approximately 1.5 million people, will be 65 years of age or older.[2] Meanwhile, total health spending in BC will reach $19.6 billion by the fiscal year 2016/17, more than 42% of all government expenditures.[3] Finally, a recent Canadian Institute of Health Information report found that although individuals aged 65 years and older comprised only 14% of the Canadian population in 2009/10, they accounted for 40% of all hospitalizations and had hospital stays 1.5 times longer than non-seniors.[4] Clearly, there is an imperative to provide effective health care services to an increasingly aging and frail population in a more cost-efficient manner.

Beginning in the early 1990s, telephone-based health care initiatives began to multiply in the United States and Canada, partly in response to these imperatives. Existing under a variety of names—"telephone case/care management",[5–7] "telephone-based disease management",[8,9] "telephonic" care,[10,11] telephone "coaching/counselling/support" initiatives,[12–14] among many others—such programs can be defined as the ongoing provision of outpatient client and/or caregiver support (e.g., advice, education, care planning, assessment, advocacy, etc., *but not including remote physiological monitoring*), initiated primarily by a health care provider (e.g., registered nurse) over an extended period of time (e.g., weeks, months) primarily or exclusively by telephone. There is typically an expectation that the telephone intervention will have an effect on patient and health care system outcomes. For example, individuals with chronic heart failure who received frequent phone calls from a nurse over a 6-month period had reduced rates of heart failure hospitalization and fewer heart failure hospital days.[15] However, periodic telephone contacts over 60 days actually increased the risk of hospital readmission in home care patients with diabetes or heart failure.[16] And a recent evaluation of the

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"OwnHealth" telephone health coaching program in Birmingham, England, found that periodic telephone calls to individuals with chronic diseases did not lead to the expected reductions in hospital admissions or secondary care costs over 12 months.[17] In general, the effect of telephone support programs have been assessed in a number of different outcomes, including health care costs,[18–20] health-related quality of life,[5,21,22] hospital admissions,[13,23,24] clinical symptoms and self-care management[6,25,26] and patient satisfaction.[9,15,27] Overall, systematic reviews and meta-analyses have shown results to be mixed at best, and even contradictory in some instances.[28–35]

Taken together, previous telephone support programs have largely been directed at clients over a broad range of ages (e.g., from 18 years of age to 90 and older) with one or more of a relatively small set of chronic illnesses (e.g., heart failure, chronic obstructive pulmonary disease, congestive heart failure, diabetes) or conditions (e.g., substance abuse, obesity). Typically, clients had been recently discharged from hospital, and program length was generally short and fixed in duration (e.g., 3–6 months). In many instances, telephone contacts were frequent (e.g., weekly, biweekly), and telephone support was often supplemented with face-to-face visits from a health care professional, either in a clinic or at the client's home. In general, the main objective of these telephone support initiatives was to follow up on clients who had recently experienced an acute episode of chronic illness, to ensure compliance with post-hospital care.

Beginning in October 2010, the Fraser Health (FH) Authority in the lower mainland of BC introduced a "surveillance nurse" telephone support position as part of a larger Integrated Health Network implementation.[36] Although the surveillance nurse position was inspired by previous telephone support programs, the initiative was unique in several key ways. In particular, the surveillance nurse supported only those clients in the FH home care program, consisting primarily of community-dwelling elderly individuals (e.g., on average, 80+ years of age) who were clinically and functionally stable but required health care supports to maintain independent living. One or more of a wide range of chronic diseases and/or functional deficits were present but were typically well managed by clients and their caregivers. Clients may have been receiving subsidized services (personal care and respite) or attending adult day programs. Other community resources (e.g., "meals-on-wheels") may have been utilized as well. Contacts by the surveillance nurse were exclusively by telephone, and no remote physiological monitoring was involved. Scheduled calls were generally less frequent (e.g., one call every one to six months), and a recent hospitalization was not required for clients to be admitted to the surveillance nurse's caseload. In general, the main objective of the surveillance nurse initiative was to proactively monitor stable (but potentially morbid) clients' well-being over time, in an effort to identify and address problematic issues before they became acute. A secondary objective of the initiative was to permit case managers to allocate greater time and effort to the more complex and unstable clients on their caseloads.

The goal of the present study was to examine the effectiveness of the FH surveillance nurse telephone support initiative. Outcomes that were evaluated included delay to an event that terminated the home care episode (i.e., institutionalization or death), the rate of emergency room and hospitalization events during home care enrollment, and the rate of days in hospital during home care enrollment. A combined covariate-matching/propensity-scoring procedure[37] was used to compare surveillance nurse clients to a highly similar group of clients that did not receive the surveillance nurse treatment.

The surveillance nurse

The conceptual foundation of the surveillance nurse position was broadly shaped by four evidence-based philosophies to health care, as shown in Table 1. Surveillance nurses are registered nurses with experience in the home care program. They are skilled communicators, educators, coaches and "care advocates"[42] who are clinically astute and able to develop and maintain rapport and actively listen in order to assess clients' conditions by telephone. Surveillance nurse caseload size is dependent on the number of home care clients in the community, but a single nurse can manage a caseload of up to 275 clients. Surveillance nurses participate in monthly teleconferences and annual face-to-face meetings to share experiences with and provide professional support and development to their colleagues.

The surveillance nurse in the home care program

Home care offices in FH can have up to 1300 clients each, depending on the size of the community. Home care clients must meet residency criteria and have either functional or cognitive deficits that require ongoing health care services to maintain independent living within the community.[43] There must also be a desire on the part of clients and/or their caregivers to remain living at home, for as long as possible.

Table 1
Four conceptual foundations of the surveillance nurse position.

Theory/Model	Description
Guided Care[38]	The integration of primary health care with recent innovations in chronic care (e.g., chronic disease self-management) to improve quality of care and thus optimize outcomes for patients with complex health care needs. In guided care, registered nurses complete a supplemental educational curriculum that gives them the special skills needed to practice. Each nurse then works in a practice with several primary care physicians and conducts clinical processes (assessment, care planning, monitoring, coaching, caregiver support) for a large caseload of multimorbid patients.
Self-Efficacy Theory[39]	Pertains to an individual's sense of mastery and control over their own health. Self-efficacy beliefs are cognitions held by an individual which determine whether or not behavior change to support better health and well-being will be initiated and sustained by that individual. As individuals develop efficacy beliefs of greater strength, they become more likely to effect beneficial and lasting behavior change.
Chronic Disease Self-Management Program[40]	Uses peers to support to educate people with various chronic diseases. This program was developed at Stanford University School of Medicine, and focuses on support for both disease- and non-disease specific actions (e.g., problem-solving, decision-making, dealing with emotions, etc.) and behavioral change.
Management of care transitions[41]	A framework that describes four pillars of a patient's successful transition from hospital to home: (a) "red flag" warning signs, (b) medication reconciliation, (c) follow up with the primary care provider within a week, and (d) a client-held health record. Transitional care refers to actions that ensure the coordination and continuity of health care as patients transfer between different levels and/or locations of service. A clinically-skilled "transitions coach" fosters communication amongst health care professionals and provides ongoing support to the client.