Canadian Geriatrics Society

THE "INTERVAL OF NEED" APPROACH: HOW TO DETERMINE IF AN OLDER PERSON CAN STAY AT HOME SAFELY OR BE DISCHARGED HOME FROM HOSPITAL SAFELY

Krista Whitney
MD, MSc (OT)
Resident, PGY3 Internal Medicine, University of Ottawa

William Dalziel
MD, FRCPC
Division of Geriatric Medicine, University of Ottawa

Corresponding Author:
Krista Whitney
kwhitney@toh.ca

Abstract

How can we best support our senior population to live in the safest and most appropriate location? It is not surprising that many seniors have unmet home care needs. As the demographic ages, health care professionals will increasingly require expertise in system navigation and case management. The "*interval of need*" concept is proposed as a novel approach to guide clinicians through the process of determining whether a senior is safe to stay at home or be discharged from hospital. The five components in this person-centred stepwise assessment include (1) evaluation of safety, comparison between (2) the interval of need and (3) the interval of support, (4) maximizing the individual and family and (5) involving supportive services. The concept applies to those with or without dementia and/or physical limitations. While most suited for the older adult population, it can also be expanded to any age.

This article has been peer reviewed.

Conflict of Interest: None

This article was published in January 2018.

Key words:
Dementia, Long-Term Care, Nursing Home, Models of Care - Innovations

Background

The senior population is Canada's fastest growing demographic. According to the 2016 Canadian census data, the number of residents in Canada over the age of 65 now surpasses the number under the age of 14[1]. Further, multi-morbidity is highly prevalent in older adults[2]. Given the aging demographic with multiple complex comorbidities, it is not surprising that many older people have unmet home care needs. According to Statistics Canada, more than 2.2 million Canadians received home care in 2012[3]. Of this population, 15% (331,000) had only 'partially met' home care needs for a chronic health condition[3]. Those with unmet or partially unmet needs report several adverse effects such as loneliness and higher levels of stress[3]. Importantly, there is also no way to know how many seniors should have home care support but lack this resource (i.e., are not registered with home care). Health care professionals are increasingly leading system navigation to ensure the senior population is supported in the most appropriate living situation.

Case Study

Mrs. L is an 84-year-old female presenting for an appointment at her family physician's clinic. Her past medical history is significant for hypertension, dyslipidemia, coronary artery disease and non-insulin dependent type II diabetes with retinopathy. Her daughter identifies concerns with falls and forgetfulness since Mrs. L's husband died one year ago. Mrs. L was hospitalized twice in the last six months for delirium secondary to UTI and pneumonia.

Medications include ASA 81 mg PO daily, Atorvastatin 40 mg PO daily, HCTZ 25 mg PO daily, Amlodipine 5 mg PO daily, Ramipril 2.5 mg PO BID, Metoprolol 25 mg PO BID and Metformin 500 mg PO BID.

Mrs. L lives in a two-storey house alone. Functional history reveals that Mrs. L ambulates without a gait aid but had four falls in the last six months. She is dependent for bathing (her daughter assists with bathing due to fear of falling), and independent for all other Activities of Daily Living (ADLs) such as toileting, dressing, grooming, transferring and feeding. She was previously considered to be independent with Instrumental Activities of Daily Living (IADLs) including finances, medication management, meal preparation, telephone use and cleaning. She is a lifelong non-driver. Her daughter provides transportation since Mrs. L's husband died and accompanies her shopping.

Upon further questioning, Mrs. L stopped using the oven two months ago but continues to use the stovetop and has burned multiple pots. She takes her medications out of the bottles yet often mixes them up and has difficulty reading labels. She previously managed all of the household finances, but her daughter recently found unpaid bills in her house. Further, the house is now increasingly unkempt.

Mrs. L's daughter requests an appointment to discuss safety and alternative living arrangements.

The "Interval of Need" Approach

The classic teaching to measure the care needs of a person is to evaluate his or her functional status, which is typically done by assessing the person's IADLs and ADLs. The clinician can then determine the functional areas where the patient is independent or has support versus functional areas where the patient has unmet requirement(s) for assistance. By determining the deficit, one can then search for home care resources or can consider relocation for assistance[4]. This traditional approach does not reflect the frequency of care needs.

An alternative framework will now be proposed, which focuses on the intensity or frequency of support that people require for independent living, partially adapted from Isaacs and Neville[5]. Figure 1 outlines the *interval of need* classification[6]. Care needs are divided into long (weekly), short (daily), critical (unpredictable) and intensive (constant) time periods based on the frequency of support required.

To apply this approach, there are three initial important considerations affecting someone's 'ability' to go home or to stay at home:

1. Safety
2. Interval of need
3. Interval of support

Figure 1: Interval of Need Classification

Interval of Need	Definition	Example
Long interval needs	Care needed less than once daily (or at least once weekly)	Shopping Money Management
Short interval needs	Care needed at least once daily	Preparing meals
Critical interval needs	Care needed unpredictably throughout the day	Toileting
Intensive interval needs	Care needed continuously	Wandering

Safety

The first consideration is safety. Seniors who choose and desire to stay in their home may live with some risks. For instance, the physical layout of the house may no longer be suitable resulting in high fall risk. Various IADLs may become increasingly challenging such as cooking (e.g., increasing concerns regarding stove safely). Another common example encountered is a person with dementia who requires a complex medication regimen, such as insulin administration or QID dosing schedules. The person's ability to manage medications is a key component of the safety assessment. Importantly, for persons with dementia, wandering is a critical safety issue that commonly requires an intensive interval of support.

It is essential to understand that if a senior is competent and has the capacity to make the decision to live independently with some risk, we must respect that they have the right to live as they want, and we should offer resources and supports to facilitate this[7]. Much can be done to mitigate these risks such as alert systems, fall alarms and medication delivery and administration systems. If it is unsafe for the person to use the stove, the microwave may be a safe option, and a stove guard can be used to allow caregivers to assist with the use of the stove and oven. Further, an interprofessional team such as occupational and physical therapists have expertise in providing a range of recommendations for physical adaptations (stair lifts or renovations) or gait aids to aid in minimizing risk.

Interval of Need versus Interval of Support

The next two considerations include the "*interval of need*" and the "*interval of support*". In 1976 Isaacs and Neville coined the term "*interval of need*", which is the length of time during which a person can manage without human assistance[5]. In practical terms, the "*interval of need*" is how long a caregiver can safely leave a person without seeing them. The "*interval of support*" is the interval of time that a caregiver can provide supportive services in person. If one compares the *interval of need* to the *interval of support*, one has a framework to decide whether someone can safely stay home or return home from hospital with existing resources, with enhanced resources or whether they require relocation to a retirement residence or long-term care home. This applies to persons with or without dementia. The interval of support calculation involves live-in caregivers, "live-out" family, friends, home care and paid support. If one can engineer a match between the intervals of need and support, an individual can safely go home or stay at home.

Figure 2 demonstrates the *interval of need* classification developed for persons with dementia, though the *interval of need* concept applies to cognitively well elderly who are frail, have physical limitations or are dependent for activities of daily living.

Figure 2: Application of the *interval of need* concept.

Interval of Need	AD Stage (MMSE)	Functional Loss	Formal Services	Caregiver Situation
2-7 days	Mild (23-28)	Some Instrumental ADLs Behaviour 0 to +	+ to ++	• Alone • May have CG
24-48 hours	Mild-Moderate (18-22)	Most Instrumental ADLs Behaviour 0 to +	+ to +++	• Alone, RH, or LTC • Family visits • May have CG
4-12 hours	Moderate (14-18)	Some Personal ADLs Behaviour 0 to ++	+ to +++ with respite (underutilized)	• Needs live-in CG, or RH • LTC needs to be considered
1-4 hours	Moderate-Severe (10-13)	Most Personal ADLs Behaviour + to +++	++ to +++ with respite	Live-in CG (usually spouse), or RH (assisted), or LTC (suggest apply now)
<1 hour	Severe (<10)	All Personal ADLs Behaviour + to ++++	++ to ++++ with respite	Devoted spouse CG or LTC (definitely apply now)
AD (Alzheimer's disease); MMSE (Mini Mental State Examination); ADL (Activities of Daily Living), Retirement home (RH); LTC (Long-term care), CG (Caregiver)				

Maximize the Individual and Family

The next step in the approach is to maximize the "individual and family" before looking at supportive service options. The local pharmacist can perform a medication review and de-prescribing may be of benefit (for resources on optimal prescribing and de-prescribing see CME Journal articles on Medication Optimization/ Polypharmacy).

A person with dementia may not seek care for concomitant chronic diseases, nor might they comply with health care recommendations. Optimizing management of conditions such as diabetes, hypertension, orthostatic hypotension, heart failure and chronic pain in a manner that can be followed by the person with dementia and their caregiver can maintain independence and prevent hospitalizations and placement.

Once the individual has been optimized from a medical standpoint, it is important to address the caregiver and family support. The issue of caregiver support is critical. This involves assistance with primary caregiver stress, burnout and depression. The shorter the *interval of need*, the greater the need for planned respite with either secondary caregivers or respite services. Involving other family members or friends (i.e., secondary caregivers) may provide welcome relief. Ideally such support would be planned and scheduled rather than only being provided to prevent crises when the primary caregiver is on the verge of burnout. Education is also very important. One study of caregiver education and a dementia care hotline demonstrated that families were able to keep their loved ones at home an extra 1.5 years with such services[8]. Referral to the local Alzheimer Society is essential for such education and counselling. If the caregiver is unavailable, has an unexpected illness or requires time off, respite services may assist. It is advisable that seniors arrange Power of Attorney for personal care/finances and advance care planning (see Facilitating Effective End-of-Life Communication – Helping People Decide).

Once the person's caregiving situation has been maximized, examine publicly funded or private homecare services and how the *interval of need* can be matched to the *interval of support* (see Figure 3). If this "match" cannot be made, then relocation to a supportive living environment such as a retirement residence or a long-term care home will need to be considered.

Supportive Services Involvement

Approximately 80-90% of services to keep seniors at home are informal (family and friends), but formal or paid services are often crucial. The clinician can search for community support services that may provide various avenues of resources such as:

1. Case Managers for system navigation
2. Personal Support Workers (PSW) for ADL support
3. Specialized therapists
4. Day-Away Programs and respite services
5. Assessment for long-term care homes versus system navigation for other supportive living environments such as retirement residences
6. Referral to other services such as Seniors' Centres, Meals on Wheels, private meal delivery services and private home-care services

Return to the Case

Mrs. L wishes to remain in her home. Mrs. L's daughter believes they need to look at relocation to a retirement home immediately. Application of the "*interval of need*" approach is as follows:

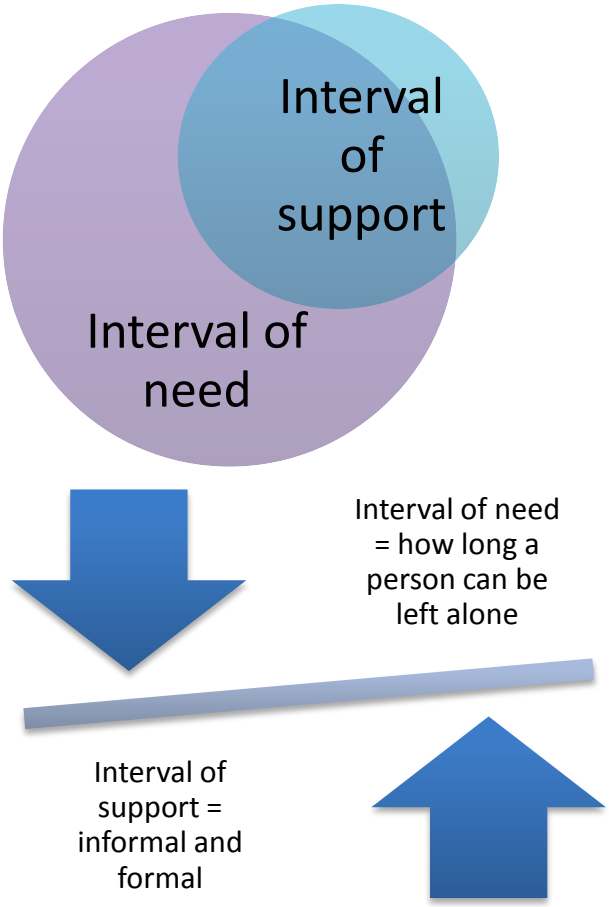
- *Safety*
    - Mrs. L's identified safety concerns include cooking unsupervised, finances, falls and medication safety. Mrs. L does not have intensive interval needs such as wandering.
- *Interval of Need versus Interval of Support*
    - Mrs. L does not have formal services for assistance. Her only family source of support is her daughter who works two jobs and has an unpredictable schedule. Her daughter feels able to provide support with finances but is unable to assist with housekeeping or supervising medications at multiple intervals throughout the day. She is feeling overwhelmed with the daily bathing regimen.
        - The identified unmet needs are now bathing, housecleaning, a safe medication regimen and safe meal planning.
- *Maximize the individual and family*
    - Individual: Mrs. L is taking medications at multiple dosing schedules. Medications are reviewed and adjusted for once daily dosing (Metoprolol changed to Bisoprolol, Ramipril changed to Perindopril and Metformin changed to Sitagliptin). She is found to have symptomatic orthostatic hypotension and HCTZ is stopped. A daily alarm reminder is set up for medications and blister packing is arranged. Dementia assessment and work up reveals mixed vascular and Alzheimer's dementia. Mrs. L is trialed on a cholinesterase inhibitor and vascular risk factors are optimized.
    - Family: Information regarding the Alzheimer Society and Social Work support is provided to Mrs. L's daughter for education, caregiver support and future planning. Her daughter recruits Mrs. L's granddaughter who is able to provide alternative *interval of support*, specifically, weekly microwavable dinners.

- *Supportive services*
    - Referrals are made to formal community support for PSW bathing support and housekeeping. A physiotherapist provides a four-wheeled walker and exercises for quadriceps strengthening. An occupational therapist conducts a home visit and provides strategies for home safety including a grab bar in the bathtub and a medical alert system. Kitchen assessment confirms that Mrs. L is not safe to use the stove or oven. The stove is disabled and Meals on Wheels information is provided. Respite service information is also provided should her family be unavailable for a period of time. A follow-up appointment is booked for discussion about advance care planning (see Facilitating Effective End-Of-Life Communication – Helping People Decide).

Conclusion

The *interval of need* approach is a simple person-centred framework to evaluate the safest and most appropriate location for seniors to live. The model can be used to determine whether a senior is safe to stay at home or be discharged home from hospital. The concept applies most frequently to those with mild to moderate dementia, but can also be applied to those with physical disabilities, and can be expanded to those of any age. Ideally, the evaluation should start early, involve an inter-professional team and empower patients and caregivers to continually reassess needs and supports. Ultimately, comprehensive assessment of the most appropriate living environment is beneficial to the patient and the health care system. Moving forward, health care professionals have an important role in advocating for increased home care services to narrow the gap between the *interval of need* and *interval of support* to help seniors live at home longer.

Figure 3: Depiction of "*interval of need*" versus "*interval of support*"



REFERENCES:

1. Statistics Canada. 2017. *Canada [Country] and Canada [Country]* (table). *Census Profile*. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released May 3, 2017. Retrieved from: http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E

2. Mundor L, Maxwell CJ, Hogan, DB, et al. Multimorbidity and healthcare utilization among home care clients with dementia in Ontario, Canada: A retrospective analysis of a population-based cohort. PLOS Medicine 2017;14:3.

3. Turcotte, M. Canadians with unmet home care needs. Ottawa: Statistics Canada 2014. Retrieved from: http://www.statcan.gc.ca/pub/75-006-x/2014001/article/14042-eng.htm

4. Kerse N, Lapsley H, Moyes S, et al. Intervals of care need: Need for care and support in advanced age: LiLACS NZ 2017. School of Population Health, The University of Auckland.

5. Isaacs B, Neville Y. The needs of old people. British Journal of Preventive and Social Medicine 1976;30:79-85.

6. World Health Organization. Current and future long-term care needs: An analysis based on the 1990 WHO study The Global Burden of Disease and the International Classification of Functioning, Disability and Health. 2002.

7. Canadian Medical Association. A Policy Framework to Guide a National Seniors Strategy for Canada. August 2015.

8. Mittelman M, Haley WE, Clay OJ, et al. Improving caregiver well-being delays nursing home placement of patients with Alzheimer disease. Neurology 2006;67(9):1592-1599.