

Assessment of older adults by emergency medical services: methodology and feasibility of a care partner Comprehensive Geriatric Assessment (CP-CGA)

Judah Goldstein, MSc, PhD*; Andrew Travers, MD[†]; Ruth Hubbard, MD*; Paige Moorhouse, MD, MPH*; Melissa K. Andrew, MD, PhD*; Kenneth Rockwood, MD*

ABSTRACT

Objectives: The Comprehensive Geriatric Assessment (CGA) is used in geriatric medicine as a means to manage the health care needs of older adults and to grade frailty. We modified the CGA so that it could be completed independently by care partners (usually family) and be used to grade frailty. Our objective was to examine the feasibility of a care partner completing the CGA at the time of the first prehospital encounter.

Methods: A prospective, observational study was conducted with a convenience sample of patients ≥ 70 years accompanied by a knowledgeable care partner. Feasibility was measured by the time required and percent completeness of items on the form based on completion by the care partner and by paramedic perception of utility.

Results: Subjects ($N = 104$) were enrolled with three postenrolment exclusions due to ineligibility. Most participants were older women living in their own home. The mean time to complete the questionnaire was 18.7 minutes (SD 11.3; median 15 minutes; interquartile range 12–20 minutes). Only 64% of the care partners recorded the time it took. Nineteen percent of paramedics completed a follow-up survey, and all felt screening for frailty was worthwhile and most ($> 70\%$) thought that the CP-CGA may be a useful approach. The study was limited by recruitment bias of potentially eligible patients, a high level of missingness in the outcome measures of interest, and low paramedic participation rates.

Conclusion: We observed a high rate of item completeness of questionnaires with a mean time to complete of 18.7 minutes in a convenience sample of older patients. A small sample of paramedics universally endorsed the utility of screening for

frailty in the prehospital setting, and many thought the CP-CGA was a helpful tool.

RÉSUMÉ

Objectif: L'évaluation gériatrique standardisée (EGS) est un outil utilisé en gériatrie permettant de prendre en charge les besoins de services de santé des personnes âgées et d'apprécier le degré de fragilité. L'EGS a été modifiée de telle sorte qu'elle puisse être remplie seule par des partenaires de soins (habituellement la famille) et qu'elle permette l'appréciation du degré de fragilité. L'étude visait à examiner la faisabilité, pour des partenaires de soins, de remplir le formulaire au moment de la première rencontre préhospitalière.

Méthode: Il s'agit d'une étude d'observation prospective, menée dans un échantillon de commodité de personnes âgées ≥ 70 ans et accompagnées d'un partenaire bien informé en matière de soins. La faisabilité a été mesurée en fonction du temps nécessaire pour remplir le formulaire et du pourcentage de réponses fournies par les partenaires de soins (PS) ainsi qu'en fonction du degré d'utilité perçue par les ambulanciers paramédicaux.

Résultats: Des sujets ($N = 104$) ont été sélectionnés, mais trois d'entre eux ont dû être écartés par la suite pour des raisons d'inadmissibilité. La plupart des participants étaient des femmes âgées, vivant dans leur propre maison. Le temps moyen nécessaire pour remplir le questionnaire était de 18.7 minutes (écart type: 11.3; durée médiane: 15 minutes; écart interquartile: 12–20 minutes). Seuls 64% des partenaires de soins ont noté le temps nécessaire à la consignation des réponses. Dix-neuf pour cent des ambulanciers paramédicaux ont répondu à une enquête de suivi, et tous étaient d'avis que l'appréciation du degré de fragilité était un

From the *Division of Geriatric Medicine, Geriatric Medicine Research Unit, Dalhousie University, Halifax, NS, and †Emergency Health Services Nova Scotia, Halifax, NS.

Correspondence to: Dr. Judah Goldstein, Division of Geriatric Medicine, Veterans Memorial Building, 1421-5955 Veterans Memorial Lane, Halifax, NS B3H 2E1; judah.goldstein@dal.ca.

This article has been peer reviewed.

élément intéressant, et la majorité d'entre eux (> 70%) estimait que l'EGS-PS pouvait s'avérer une approche utile. L'étude comporte toutefois des faiblesses, notamment un biais lié à la recherche de sujets potentiels, un manque important de critères d'évaluation jugés intéressants et un faible taux de participation des ambulanciers paramédicaux. **Conclusions:** L'étude nous a permis de constater un degré élevé de remplissage du questionnaire, qui a exigé en moyenne 18.7 minutes, et ce, dans un échantillon de

commodité composé de personnes âgées. Un faible pourcentage d'ambulanciers paramédicaux s'est prononcé globalement en faveur de l'utilité du degré d'appréciation de la fragilité en phase préhospitalière, mais bon nombre considéraient l'EGS-PS comme un outil utile.

Keywords: aged, Comprehensive Geriatric Assessment (CGA), emergency medical services, frail

Older adults, particularly the "oldest old" (≥ 85), are the most rapidly growing segment of society.¹ Societal aging may be of particular concern for emergency medical services (EMS) because older adults are overrepresented in the patient population served by EMS systems of care.^{2,3} Older adults in the emergency department (ED) often require more resources compared to younger age groups.⁴ The presence of frailty (a state of vulnerability arising as a result of multiple, interacting medical and social problems) further complicates care.^{5,6} Frailty is common, with prevalence estimates of 22% or more in subjects ≥ 65 years old,⁷ and is a strong predictor of serious adverse events.^{8,9} Currently, there is a lack of research on the measurement and impact of frailty in the prehospital setting.¹⁰

The frailty index (FI) is a count of the number of problems that a person has accumulated over time.¹¹ The FI is a proportion of health deficits present and typically considers 30 to 40 items (symptoms, diseases, or disabilities).¹² It has been cross-validated in a number of population-based analyses with reproducible characteristics, including an upper limit to deficit accumulation near 0.7.^{13,14} At this level, patients are as sick as they can be and are often institutionalized or close to death. Its predictive validity has been evaluated in ED patients, with the FI being predictive of severe adverse events (death, hospitalization, and institutionalization).¹⁵ The FI can be derived from a standard Comprehensive Geriatric Assessment (CGA).^{14,16} Although the FI has been derived from CGA in the past,¹⁶ it has not been evaluated prospectively in the prehospital setting. For the current study, we modified the CGA so that care partners could complete it.

The CGA is used in geriatric medicine to capture relevant information about the health status and function of an older person. It is an essential tool for geriatricians when managing complex patients. It facilitates accurate diagnosis, holistic management, and effective communication within the multidisciplinary team.^{17,18} The CGA

provides insight into one's level of fitness/frailty and is used to guide care.¹⁹ It has been suggested that all frail older adults admitted through the ED should have a CGA,¹⁹ suggesting that determining frailty status in the ED may contribute to overall care.

Nongeriatricians, however, report that they find it burdensome to gather such detailed information.²⁰ Given that much of what is important in determining an individual's level of frailty is known to informal care partners or family members, it is conceivable that care partners may be able to complete the assessment using the same tool (CGA), modified for their use, at the time of the initial assessment. We developed a tool based on the CGA (Care Partner Comprehensive Geriatric Assessment [CP-CGA]) and evaluated it in two different settings: the prehospital setting, with its unique time constraints, and the geriatric ambulatory care setting, where using the CGA is standard practice. The feasibility of the CP-CGA was assessed in both settings. The in-hospital feasibility evaluation of the tool as a mechanism to measure frailty is reported elsewhere.

Our objective was to examine the feasibility of a care partner completing the CGA at the time of the first prehospital encounter and the perceived utility and comfort of the paramedic with this tool in the prehospital setting as a measure of frailty.

METHODS

Study design and setting

We conducted a prospective, observational study in one region (Halifax, NS) of a provincial EMS system between February 2009 and March 2010. The Nova Scotia Ground Ambulance service covers an area of 55,000 km² and approximately 1 million people. The service receives over 110,000 requests for service per year, resulting in over 90,000 patient transports.²¹

To be eligible, subjects needed to have a care partner with them (typically spouse or child) who was

knowledgeable about their medical and social history and had to be treated by medics trained to provide the tool. Patients transported to the Halifax ED and those assessed by paramedics but not transported were eligible for inclusion in the study. The survey was presented only in English, so language may have prohibited some from participating. Exclusion criteria were age < 70 years, lack of a care partner, inability of the care partner to complete the CP-CGA form and transport of the patient to a nonstudy hospital, or refusal (by either patient or care partner) to participate. The study was approved by the Capital District Health Authority Research Ethics Committee.

The feasibility outcome measures for the study were the time the care partners took to complete and the completeness rate of the tool, as well as care partner and paramedic comfort with using the tool as measured on a Likert 5-point scale.

Recruitment and data collection

The CP-CGA (Appendix, available with online version only) was derived from the in-hospital tool defined by Jones and colleagues and Rockwood and Mitnitski.^{16,22} Each question on the CP-CGA corresponds to an item on the in-hospital CGA. The tool was composed of 62 questions derived from 10 domains, including cognition, emotion, communication, mobility, balance, bladder, bowel, nutrition, activities of daily living, and social factors. The tool specifically asked about 14 comorbidities and the number of medications. The CP-CGA estimated the subject's frailty status using the FI and the Canadian Study of Health and Aging Clinical Frailty Scale (CSHA-CFS) (Figure 1).²³ The original version included seven clinical descriptors to stratify patients based on their level of fitness or frailty. The scale employed in the CP-CGA was modified to include categories for very severe frailty (with death expected within 6 months) and terminal illness that is nondisabling.²⁴

Staff in the central region ($N = 156$) (including management, communication officers, and paramedics) were provided with a brief training session on the CP-CGA during mandatory in-services (fall 2008). Paramedics applied the inclusion/exclusion criteria and recruited the patients into the study. The care partner was identified as someone who spent sufficient time with the patient to be knowledgeable about his or her health and social circumstances. Ultimately, recruitment was at the discretion of the

attending paramedic. The care partner completed the CP-CGA while the patient was assessed and treated by paramedics. The care partner also recorded the time to complete as well as three Likert-style questions pertaining to his or her satisfaction with the tool.

Following the completion of the study, paramedics were asked to complete a survey either online using the Dalhousie University *Opinio* survey software (ObjectPlanet Inc., Oslo, Norway) hosted on the Dalhousie *Opinio* web server or in hard-copy version. This survey captured the paramedic's thoughts on the assessment tool and general care provision for frail older adults. This questionnaire also inquired about the challenges associated with patient enrolment, the perceived value of the tool, and barriers for use.

Data analysis

Data were analyzed using SPSS version 15.0 (Chicago, IL). Descriptive statistics were used to characterize the sample and to provide details pertaining to the care partner respondent. Feasibility estimates of time to complete and percent completeness of items were compiled. Categorical variables were analyzed with the chi-square test, whereas continuous variables were compared using the *t*-test or one-way analysis of variance as appropriate. Paramedic and care partner acceptability of the tool was determined using a Likert scale. Free text feedback was assessed by thematic analysis. Incomplete questionnaires were included in the final data analysis.

RESULTS

During the study period, there were 4,829 potentially eligible patients who met some but not all of the eligibility criteria. The true number of eligible patients is unknown as all of the inclusion and exclusion criteria are not routinely tracked on ambulance call records. Paramedics enrolled a convenience sample of 104, and of these, 3 did not meet the eligibility criteria and were removed from the analysis postenrolment.

Participants were mostly older females who lived in their own home (Table 1). Most were classified as Canadian Triage and Acuity Scale (CTAS) 3 (urgent), with the most common presenting complaint being respiratory problems. The median paramedic-completed Clinical Frailty Scale rating was 5 (IQR 4–6) (mildly frail). The CP-CGA was typically completed by a relative, usually the spouse or an offspring (Table 2).

-
- Very fit.** (category 1)
People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.
- Well.** (category 2)
People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.
- Managing Well.** (category 3)
People whose medical problems are well controlled, but are not regularly active beyond routine walking.
- Vulnerable.** (category 4)
While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “slowed up”, and/or being tired during the day.
- Mildly frail.** (category 5)
These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.
- Moderately frail.** (category 6)
People need help with all outside activities and with keeping house. They often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.
- Severely frail.** (category 7)
Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).
- Very Severely frail.** (category 8)
Completely dependent, approaching the end of life. Typically, they could not recover from minor illness.
- Terminally ill.** (category 9)
Approaching the end of life. This category applies to people with a life expectancy < 6 months, who are not otherwise evidently frail.

Figure 1. Canadian Study of Health and Aging Clinical Frailty Scale Version 1.2. The revised scale includes categories for the very severely frail (category 8) with death expected within 6 months and terminally ill (category 9) with no functional impairment. Courtesy of the Geriatric Medicine Research Unit, Dalhousie University, Halifax, Nova Scotia.

Many subjects (42%) lived with the care partner, and most respondents (73%) stated that they provided the majority of care. Many care partners reported a high (20%) or moderate (42%) level of stress, and almost half stated that they needed more help with providing care.

The time to complete for all care partners was estimated by only 64% of the sample as this data point was missing in the other patients. The mean time to completion was 18.7 ± 11.3 minutes (median 15 minutes; IQR 12–20 minutes) ($n = 64$) (Table 3). The completeness rate for all variables on the questionnaire was $\geq 93.5\%$ (10.9). The sample was further explored

with respect to the care partner’s relationship with the subject. There were no significant differences in terms of the time to complete except a trend toward a shorter completion time if the survey was completed by an offspring. A nonsignificant trend toward a higher completeness rate was also observed when an offspring was the care partner (see Table 3).

Care partner satisfaction

Care partners ($N = 101$) were asked to evaluate the CP-CGA in terms of the clarity of questions, length, and

Table 1. Baseline characteristics for subjects (N = 101) enrolled in the study

Characteristic	n (%)*
Age, mean (SD)	82.93 (6.07)
Female	64 (63)
Marital status	
Married	39 (38)
Widowed	52 (52)
Divorced or single	10 (10)
Education (yr), mean (SD)	10.4 (2.3)
Living arrangement	
Own home	49 (49)
Apartment	31 (31)
Other	21 (21)
CTAS	
2 (emergent)	13 (13)
3 (urgent)	75 (77)
4 or 5 (less urgent)	10 (10)
Chief complaint	
Respiratory	25 (26)
Trauma (falls)	13 (13)
Nonspecific (e.g., weakness, general malaise)	12 (12)
CSHA-CFS, median (IQR)	5 (mildly frail) (4–6)
Minimum	1 (very fit)
Maximum	9 (terminally ill)

CTAS = Canadian Triage and Acuity Scale; CSHA-CFS = Canadian Study of Health and Aging Clinical Frailty Scale; IQR = interquartile range.
*Unless otherwise indicated.

scope. The response rate for these questions was 95%. Most care partners (92%) strongly agreed or agreed that the questions were clear and easy to understand. Most respondents (87%) felt that the survey was an appropriate length. Some care partners (20%) thought that important areas of health were not covered. Nineteen care partners (20%) provided optional comments about the questionnaire, and these were summarized in four themes: 1) the relationship of the care partner (context), 2) survey design, 3) health topics not covered, and 4) reason for completing the survey (Table 4).

Paramedic feedback

Twenty-one respondents (12 primary care and 9 intermediate/advanced care paramedics) completed the paramedic follow-up survey, representing a 19% response rate (110 surveys sent via e-mail to field paramedics). Most respondents were male (62%) with 7.2 (4.9) years of experience. Half of the respondents reported enrolling a patient. All respondents thought

Table 2. Characteristics of the care partner and current supports (N = 101)

Characteristic	n (%)
Relationship of CP	
Offspring	48 (48)
Spouse	27 (27)
Sibling	5 (5)
Other	20 (20)
Primary care provider—yes	73 (72)
Living arrangement	
With CP	42 (42)
Alone	34 (34)
With someone else	23 (23)
Level of stress (CP)	
High	20 (20)
Moderate	42 (42)
Low	27 (27)
No stress	11 (11)
Needs more help—yes	46 (50)
Additional supports	
Private help	22 (22)
Home care (e.g., Victoria Order of Nurses)	36 (36)
Friends help	61 (60)

CP = care partner.

there was value in screening for frailty, with 71% stating that the CP-CGA may be a useful approach.

The major barriers to enrolment based on the paramedic respondents were the lack of a care partner

Table 3. Feasibility outcomes for time to complete (n = 64) and percent completeness of items (n = 101) on the CP-CGA

Characteristic	Mean (SD)
Time to complete (min), mean (SD)*	18.71 (11.3) (median 15 min [n = 64])
IQR	12–20
Minimum	5
Maximum	60
Spouse	20.41 (12.65) (n = 17)
Sibling	34.5 (n = 2)
Child	15 (7.83) (n = 31)
Other	22.5 (12.94) (n = 14)
Completeness of items	93.5 (10.9)
Spouse	88.1 (14.5)
Sibling	98.6
Offspring	97.1 (5.8)
Other	92.2 (12.5)

CP-CGA = Care Partner Comprehensive Geriatric Assessment; IQR = interquartile range.
*n = 64 for time to complete as 37 care partners did not complete this question.

Table 4. Thematic analysis of free text feedback as provided by the care partner

Theme	Responses	Comments
Care partner relationship	2	Context of relationship: non-family member, stress, competing priorities (employment)
Survey design	11	More response items were required (too many "yes" or "no," with no room for "maybe"); 2-week period of change not adequate
Health topic not covered	3	Mental health, safety, socialization, activities, stimulation, attitude or family concern
Reasoning for completing survey	4	Survey acted as a distraction, "tired caregiver"

Nineteen care partners provided written feedback. Care partners were asked if they would like to provide additional comments about the questionnaire.

present (71%, $n = 15$), transport to a nonstudy hospital (52%, $n = 11$), and lack of awareness (38%, $n = 8$). Paramedics also commented on issues of literacy (and health literacy) of care partners, prioritization of tasks, and the overall stress of the situation affecting their ability to enrol. Paramedics identified three challenges to providing care for older adults: 1) communication issues, 2) a perceived lack of health literacy, and 3) difficulties ascertaining the baseline state of the patient (captured by the CP-CGA).

DISCUSSION

This study demonstrated the feasibility of a care partner applying the modified CGA as a tool to measure frailty in the prehospital setting. The completion rate was high, and the time required was < 20 minutes. Both the care partner and the limited responding paramedics were comfortable with the tool and felt it was useful. In this study, care partners were approached by paramedics to complete the tool either on scene or en route to the hospital with most forms being completed on arrival at the ED. Due to offload delays, many patients wait for long periods, allowing time for collection of detailed information. Regions with long transit times to hospital would also be amenable to prehospital completion of the tool.

Frailty is a term used to describe differences in the vulnerability to adverse outcomes for people of the same age. Those who are frail have multisystem impairment, making the individual vulnerable to further stressors. There are a number of approaches to frailty measurement, including a phenotype of frailty,²⁵ scales,²⁴ indicators,^{26,27} and indexes.¹¹ In the prehospital setting, frailty can be manifested as nonspecific presenting complaints with patients potentially triaged less urgently than their actual health

status.²⁸ The CP-CGA can quantify frailty in a number of different ways (deficit accumulation and the CSHA-CFS). Future work should evaluate the reliability and validity of this approach against the in-hospital CGA and resource allocation, paramedic comfort, scene time, and sensibility in a representative sample.

Methodological challenges with prehospital geriatric research

In general, the EMS literature reports comparatively little geriatric research, despite how commonly older adults are the recipients of care. Geriatric research in the prehospital setting is particularly challenging in the presence of multiple comorbidities, communication, and cognitive issues. The recruitment in this trial was problematic, with a small percentage of eligible patients enrolled in a convenience sample. The study required the presence of a care partner able and willing to complete the tool. Paramedic judgment determined which care partner was approached to complete the form based on the care partner's physical or cognitive impairment. This reduced the potentially eligible sample considerably and introduced a recruitment bias based on paramedic judgment of the care partner. In addition, by design, no patient with a CTAS 1 (emergent requiring immediate care) was enrolled, limiting the results to CTAS 2 to 5 patients. Although the completeness of items was high, one question often missed was the time to complete, which was one of our primary feasibility outcome measures. Only 64% ($n = 64$) of these data was available.

Limitations

This was a convenience sample of patients with enrolment at the discretion of the practitioner,

increasing the potential for selection bias. In addition to the methodological issues relevant to prehospita geriatric research, there were implementation issues that have limited the validity of the results. Although not anticipated to be a barrier to enrolment, there were difficulties with the availability of resources (study forms), awareness of the study, and communication posttransition after the ED was moved to a new facility during this study. Another issue that affected the enrolment process was limitations in the exposure of the patients to paramedics trained in the study. Nova Scotia has a provincial EMS system, so it is not uncommon for crews from other regions to be dispatched to calls in the study region as they were the closest vehicle. Only paramedics in the study region who were trained in this protocol could enrol. In addition, patients were enrolled if they were being transported to the Halifax ED to ensure that they would receive a geriatric consultation from a participating geriatrician as this was important for the validation study. Many of the surveys were completed on arrival at the hospital during offload delays, which may limit the use of this tool where these conditions do not exist. The response rate for the paramedic survey on comfort and utility was low (19%), limiting the generalizability of these findings.

Implications for research

Future research should evaluate the clinical application of a CP-CGA to the care of the patient, the validity of the tool against a standard, and the contribution to care when the CP-CGA is completed in the prehospita setting rather than the ED.

Potential implications for practice

Given the limitations of this study design and the results, this tool is not ready for implementation. That being said, the use of emergency services by older adults is increasing,²⁹ so it is imperative that paramedics have the knowledge and tools to provide effective care, and continued research in the prehospita setting is warranted. The CP-CGA may prove with future evaluation to be useful for frailty screening, and the time-sensitive nature of this assessment may contribute to overall care. For example, the CP-CGA provides information on the subject's baseline status (e.g.,

cognition and function) and relative fitness/frailty before the illness or injury and may be used to guide treatment; frail older adults may benefit most from supportive care, whereas the fit older adult may benefit from more aggressive "usual" treatment.³⁰ Early evaluation and identification of frailty are important components to providing care to older adults, but it is unknown if there are advantages to early identification in the prehospita setting versus the ED versus in-hospital evaluation.^{31,32} A survey approaching 20 minutes may be too long in an uncomplicated EMS call with short transport times; however, the CP-CGA may prove most useful on nontransport responses where a thorough assessment is necessary or for patients with complex issues transported to hospital and in regions where offload delays are prevalent or transport times are long.

CONCLUSION

We developed a CP-CGA tool and demonstrated that care partners can complete the items in the tool and were comfortable doing so in the prehospita setting. The limitations of the study design and implementation challenges suggest that further research is required to validate the tool, evaluate implementation, and define the contribution to overall care of the older adults when the tool is applied in the prehospita setting.

Competing interests: Judah Goldstein was supported by a student research award from the Nova Scotia Health Research Foundation and funding from the Atlantic Regional Training Centre. Kenneth Rockwood receives career support from the Dalhousie Medical Research Foundation as the Kathryn Allen Weldon Professor of Alzheimer Research.

REFERENCES

1. Louri DB. Extraordinary longevity: individual and societal issues. *J Am Geriatr Soc* 2005;53(9 Suppl):S317-9, doi:10.1111/j.1532-5415.2005.53499.x.
2. Canadian Institute for Health Information. *Understanding emergency department wait times: who is using emergency departments and how long are they waiting?* 2005. Available at: <http://www.cihi.ca> (accessed February 26, 2008).
3. Shah MN, Bazarian JJ, Lerner B, et al. The epidemiology of emergency medical services use by older adults: an analysis of the National Hospital Ambulatory Medical Care Survey. *Acad Emerg Med* 2007;14:441-8.
4. Aminzadeh F, Dalziel WB. Older adults in the emergency department: a systematic review of patterns of use, adverse

- outcomes, and effectiveness of interventions. *Ann Emerg Med* 2002;39:238-47, doi:[10.1067/mem.2002.121523](https://doi.org/10.1067/mem.2002.121523).
5. Rockwood K, Fox RA, Stolee P, et al. Frailty in elderly people: an evolving concept. *CMAJ* 1994;150:489-95.
 6. Hogan DB, MacKnight C, Bergman H. Models, definitions, and criteria of frailty. *Aging Clin Exp Res* 2003;15(3 Suppl): 1-29.
 7. Song X, Mitnitski A, Rockwood K. Prevalence and 10-year outcomes of frailty in older adults in relation to deficit accumulation. *J Am Geriatr Soc* 2010;58:681-7, doi:[10.1111/j.1532-5415.2010.02764.x](https://doi.org/10.1111/j.1532-5415.2010.02764.x).
 8. Schuurmans H, Steverink N, Lindenberg S, et al. Old or frail: what tells us more? *J Gerontol A Biol Sci Med Sci* 2004; 59:M962-5, doi:[10.1093/gerona/59.9.M962](https://doi.org/10.1093/gerona/59.9.M962).
 9. Rockwood K, Mitnitski A, Song X, et al. Long-term risks of death and institutionalization of elderly people in relation to deficit accumulation at age 70. *J Am Geriatr Soc* 2006;54: 975-9, doi:[10.1111/j.1532-5415.2006.00738.x](https://doi.org/10.1111/j.1532-5415.2006.00738.x).
 10. Goldstein JP, Andrew MK, Travers A. Frailty in older adults using pre-hospital care and the emergency department: a narrative review. *Can Geriatr J* 2012;15:16-22.
 11. Mitnitski AB, Mogilner AJ, Rockwood K. Accumulation of deficits as a proxy measure of aging. *Sci World J* 2001;1:323-36, doi:[10.1100/tsw.2001.58](https://doi.org/10.1100/tsw.2001.58).
 12. Searle SD, Mitnitski A, Gahbauer EA, et al. A standard procedure for creating a frailty index. *BMC Geriatr* 2008; 8:24.
 13. Rockwood K, Mitnitski A. Limits to deficit accumulation in elderly people. *Mech Ageing Dev* 2006;127:494-6, doi: [10.1016/j.mad.2006.01.002](https://doi.org/10.1016/j.mad.2006.01.002).
 14. Rockwood K, Mitnitski A. How might deficit accumulation give rise to frailty? *J Frailty Aging* 2012;1(1):7-10.
 15. Hastings NS, Purser JL, Johnson KS, et al. Frailty predicts some but not all adverse outcomes in older adults discharged from the emergency department. *J Am Geriatr Soc* 2008;56: 1651-7, doi:[10.1111/j.1532-5415.2008.01840.x](https://doi.org/10.1111/j.1532-5415.2008.01840.x).
 16. Jones DM, Song X, Rockwood K. Operationalizing a frailty index from a standardized comprehensive geriatric assessment. *J Am Geriatr Soc* 2004;52:1929-33, doi:[10.1111/j.1532-5415.2004.52521.x](https://doi.org/10.1111/j.1532-5415.2004.52521.x).
 17. Rockwood K, Stadnyk K, Carver D, et al. A clinometric evaluation of specialized geriatric care for rural dwelling, frail older people. *J Am Geriatr Soc* 2000;48:1080-5.
 18. Stuck AE, Siu AL, Wieland GD, et al. Comprehensive geriatric assessment: a meta-analysis of controlled trials. *Lancet* 1993;342:1032-6, doi:[10.1016/0140-6736\(93\)92884-V](https://doi.org/10.1016/0140-6736(93)92884-V).
 19. Ellis G, Whitehead MA, Robinson D, et al. Comprehensive geriatric assessment for older adults admitted to hospital: meta-analysis of randomized controlled trials. *BMJ* 2011; 343:d6553, doi:[10.1136/bmj.d6553](https://doi.org/10.1136/bmj.d6553).
 20. Samaras S, Chevalley T, Samaras D, Gold G. Older patients in the emergency department: a review. *Ann Emerg Med* 2010;56:261-9, doi:[10.1016/j.annemergmed.2010.04.015](https://doi.org/10.1016/j.annemergmed.2010.04.015).
 21. Emergency Health Services Nova Scotia. *Annual report 2007/08*. Available at: <http://www.gov.ns.ca/health/ehs/> (accessed January 1, 2009).
 22. Rockwood K, Mitnitski A. Frailty defined by deficit accumulation and geriatric medicine defined by frailty. *Clin Geriatr Med* 2011;27:17-26, doi:[10.1016/j.cger.2010.08.008](https://doi.org/10.1016/j.cger.2010.08.008).
 23. Rockwood K, Song X, MacKnight C, et al. A global clinical measure of fitness and frailty in elderly people. *CMAJ* 2005; 173:489-95, doi:[10.1503/cmaj.050051](https://doi.org/10.1503/cmaj.050051).
 24. Goldstein J, Hubbard RE, Moorhouse P, Andrew MK. Feasibility of using information derived from a care partner to develop a frailty index based on comprehensive geriatric assessment. *J Frailty Ageing* 2013;2:15-21.
 25. Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci* 2001;56A:146-56, doi:[10.1093/gerona/56.3.M146](https://doi.org/10.1093/gerona/56.3.M146).
 26. Gobbens RJJ, Van Assen MALM, Luijkx KG, et al. The predictive validity of the Tilburg frailty indicator: disability, health care utilization, and quality of life in a population at risk. *Gerontologist* 2012;1-13.
 27. Steverink N, Slaets JPJ, Schuurmans H, et al. Measuring frailty, development and testing of the Groningen Frailty Indicator (GFI). *Gerontologist* 2001;41:236-7.
 28. Rutschmann OT, Chevalley T, Zumwald Z, et al. Pitfalls in the emergency department triage of frail elderly patients without specific complaints. *Swiss Med Wkly* 2005;135: 145-50.
 29. Lowthian JA, Jolley DJ, Curtis AJ, et al. The challenges of population ageing: accelerating demand for emergency ambulance services by older patients, 1995-2015. *Med J Aust* 2011;194:574-8.
 30. Rockwood K, MacKnight C, Bergman H. Measuring frailty in geriatric patients [letter]. *CMAJ* 2006;174:353-4, doi: [10.1503/cmaj.1050249](https://doi.org/10.1503/cmaj.1050249).
 31. Conroy S. Emergency room geriatric assessment – urgent, important or both? *Age Ageing* 2008;36:612-3, doi:[10.1093/ageing/afn215](https://doi.org/10.1093/ageing/afn215).
 32. Moorhouse P, Mallery L. PATH: a new approach to end-of-life care. *Can Rev Alzheimer's Other Dementias* 2010;13: 4-8.

APPENDIX

Care Partner Comprehensive Geriatric Assessment

Please record the present time (Prior to starting this questionnaire). _____ AM/PM

Please help us by answering these questions about the person you care for. To help us provide the best care we would like to know more about their health. First, please provide us with some background information about this person.

Social

<p>Marital Status Is the person you care for:</p> <p><input type="checkbox"/> Married (including common-law) <input type="checkbox"/> Widowed <input type="checkbox"/> Divorced or separated <input type="checkbox"/> Single</p>	<p>Does the person you care for need more help at home?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p>
<p>Living arrangement Does the person you care for live:</p> <p><input type="checkbox"/> Alone <input type="checkbox"/> With spouse <input type="checkbox"/> With someone else</p>	<p>Are there stairs to climb to get into the home?</p> <p><input type="checkbox"/> YES (How many stairs? ____) <input type="checkbox"/> NO</p>
<p>Supports What is your relationship with the patient?</p> <p><input type="checkbox"/> Spouse <input type="checkbox"/> Sibling <input type="checkbox"/> Child <input type="checkbox"/> Other</p> <p>What help does the person you care for have at home? (Choose all that apply)</p> <p><input type="checkbox"/> Help from friends and family <input type="checkbox"/> Help from Home Care, VON, Veterans' Affairs <input type="checkbox"/> Privately arranged help (ex. hired help with housekeeping)</p> <p>Does the person you care for live in their:</p> <p><input type="checkbox"/> Own home/condominium <input type="checkbox"/> Rented home/apartment <input type="checkbox"/> Other</p> <p>_____</p>	<p>Are there stairs they need to climb day-to-day indoors?</p> <p><input type="checkbox"/> YES (How many stairs? ____) <input type="checkbox"/> NO</p>
	<p>Education What was the highest grade they completed at school?</p> <p>_____</p> <p>Did they take further courses after high school?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO Please give detail (e.g. University Degree, Technical School)</p> <p>_____</p> <p>What was their main job or occupation?</p> <p>_____</p>

Care Partner Stress

<p>Are you the person who mostly provides care for this person?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>If no, please indicate the primary care person:</p> <p>_____</p>	<p>How would you describe the level of stress of caring for this person?</p> <p><input type="checkbox"/> No stress <input type="checkbox"/> Low level of stress <input type="checkbox"/> Moderate level of stress <input type="checkbox"/> High level of stress - often overwhelmed</p>
--	--

Please continue the questionnaire on page 2. Thank you.

Care Partner Comprehensive Geriatric Assessment pg. 2

Medical Problems

Below is a list of health problems people often have. Does the person you care for have any of the following?

High blood pressure	YES	NO
Heart and circulation problems	YES	NO
Stroke, or effects of stroke	YES	NO
Arthritis or rheumatism	YES	NO
Parkinson's disease	YES	NO
Dental problems	YES	NO
Lung or breathing problems	YES	NO
Troubles with stomach/digestive	YES	NO
Kidney trouble	YES	NO
Diabetes	YES	NO
Trouble with feet or ankles	YES	NO
Skin problems	YES	NO
Recent broken bones	YES	NO
Thyroid problems	YES	NO

Other health problems please specify:

Medications

How many different medications does the person you care for take per day?

- Five or more medications
- Between two and four medications
- One medication
- No medications

Health Description

How would you describe their health to someone who had not met them before?

Health Attitude

In general, how would the person you care for rate their own health?

- Excellent
- Good
- Fair
- Poor
- Couldn't say

Falls

Has the person you care for fallen down in the past year? For example, a fall means a sudden, unexpected drop from a standing, sitting, or laying position (bed) that ended with the person on the floor or ground.

- YES
- NO

If yes please tell us how many falls you are aware of in the last year?

Sleep

Does the person you care for have sleep problems?

- YES, disrupted
- YES, daytime drowsiness
- NO, no problems

Care Partner Comprehensive Geriatric Assessment pg.3

These questions also refer to the person you care for. Think of this person when you answer these questions.

We want you to think about two time points – two weeks ago, which is in the left hand column, and today, which is in the right hand column.

		2 weeks ago	Today
General Health			
In general, would you say their health is:	Excellent	<input type="checkbox"/>	<input type="checkbox"/>
	Very good	<input type="checkbox"/>	<input type="checkbox"/>
	Good	<input type="checkbox"/>	<input type="checkbox"/>
	Fair	<input type="checkbox"/>	<input type="checkbox"/>
	Poor	<input type="checkbox"/>	<input type="checkbox"/>
	Very Poor	<input type="checkbox"/>	<input type="checkbox"/>
Emotional			
Do you think the person you care for is depressed?	YES, depressed	<input type="checkbox"/>	<input type="checkbox"/>
	NO, but seems to have low mood at times	<input type="checkbox"/>	<input type="checkbox"/>
	NO, not depressed	<input type="checkbox"/>	<input type="checkbox"/>
Do you think the person you care for worries a lot or gets anxious?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Do you think the person you care for feels exhausted or tired all the time?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Mental Status			
Does the person you care for have problems with memory <i>or</i> thinking?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Communication			
Does the person you care for have any problems speaking to make themselves understood?	YES, some or great difficulty	<input type="checkbox"/>	<input type="checkbox"/>
	NO, no problems	<input type="checkbox"/>	<input type="checkbox"/>
Does the person you care for have difficulty hearing? For example, do they have problems hearing ordinary speaking?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO, wears hearing aid	<input type="checkbox"/>	<input type="checkbox"/>
	NO, no problems	<input type="checkbox"/>	<input type="checkbox"/>
Does the person you care for have problems with eyesight? (even when wearing glasses)	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Appetite			
Has there been a change in their appetite?	YES, they have a bigger appetite	<input type="checkbox"/>	<input type="checkbox"/>
	YES, they have a smaller appetite	<input type="checkbox"/>	<input type="checkbox"/>
	NO, there has been no change	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition			
Has there been a change in their weight in the last six months?	YES, weight loss more than 10lbs	<input type="checkbox"/>	
	YES, weight loss less than 10lbs	<input type="checkbox"/>	
	YES, weight gain	<input type="checkbox"/>	
	NO, weight has stayed the same	<input type="checkbox"/>	

Care Partner Comprehensive Geriatric Assessment pg.4

These questions also refer to the person you care for. Think of this person when you answer these questions.

We want you to think about two time points – two weeks ago, which is in the left hand column, and today, which is in the right hand column.

		2 weeks ago	Today
Balance			
Does the person you care for have problems with balance?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Do they complain of feeling dizzy or lightheaded?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Do they require assistance of a person or aid (walker/cane) to prevent falling?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Do they hold on to furniture to keep from falling?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Mobility			
Is the person you care for able to get out of a bed or chair by themselves?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	YES, with some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>
Is the person you care for able to walk? (with or without a cane or walker)	YES, able to walk by themselves at their usual speed	<input type="checkbox"/>	<input type="checkbox"/>
	YES, able to walk by themselves but walks slowly	<input type="checkbox"/>	<input type="checkbox"/>
	YES, but needs some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO, needs a lot of help or cannot walk at all	<input type="checkbox"/>	<input type="checkbox"/>
Bowels			
Does the person you care for have problems with control of their bowels?	YES, wears pad or needs full assistance with colostomy bag	<input type="checkbox"/>	<input type="checkbox"/>
	YES, occasional soiling or needs some assistance with bag	<input type="checkbox"/>	<input type="checkbox"/>
	NO, no problems	<input type="checkbox"/>	<input type="checkbox"/>
Bladder			
Does the person you care for have problems with control of their bladder?	YES, wears pad or needs full assistance with catheter	<input type="checkbox"/>	<input type="checkbox"/>
	YES, occasional bladder control loss or needs some assistance with catheter	<input type="checkbox"/>	<input type="checkbox"/>
	NO, no problems	<input type="checkbox"/>	<input type="checkbox"/>

Please continue the questionnaire on page 5. Thank you.

Care Partner Comprehensive Geriatric Assessment pg.5

These questions also refer to the person you care for. Think of this person when you answer these questions.

We want you to think about two time points – two weeks ago, which is in the left hand column, and today, which is in the right hand column.










		2 weeks ago	Today
Function			
Can the person you care for feed themselves?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO, or only with significant help	<input type="checkbox"/>	<input type="checkbox"/>
Can the person you care for take a bath or shower?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, with some help	<input type="checkbox"/>	<input type="checkbox"/>
	Only with great deal of help	<input type="checkbox"/>	<input type="checkbox"/>
Can the person you care for dress themselves?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, some help	<input type="checkbox"/>	<input type="checkbox"/>
	Only with great deal of help	<input type="checkbox"/>	<input type="checkbox"/>
Does the person you care for drive?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	YES, but I am concerned about safety	<input type="checkbox"/>	<input type="checkbox"/>
	NO, has stopped	<input type="checkbox"/>	<input type="checkbox"/>
	NO, never drove	<input type="checkbox"/>	<input type="checkbox"/>
Can the person you care for do day-to-day shopping?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO, not at all	<input type="checkbox"/>	<input type="checkbox"/>
	NO, has never done shopping	<input type="checkbox"/>	<input type="checkbox"/>
Can the person you care for do day-to-day household cleaning?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO, can't do at all	<input type="checkbox"/>	<input type="checkbox"/>
	NO, has never done cleaning	<input type="checkbox"/>	<input type="checkbox"/>
Can the person you care for cook well enough to maintain their nutrition?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO, can't do at all	<input type="checkbox"/>	<input type="checkbox"/>
	NO, has never done cooking	<input type="checkbox"/>	<input type="checkbox"/>
Can the person you care for look after taking their own medications?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO, can't do at all	<input type="checkbox"/>	<input type="checkbox"/>
	NO, doesn't need any medications	<input type="checkbox"/>	<input type="checkbox"/>
Can the person you care for look after their own banking and financial affairs (pay their own bills)?	YES, without help	<input type="checkbox"/>	<input type="checkbox"/>
	YES, some help	<input type="checkbox"/>	<input type="checkbox"/>
	NO, can't do at all	<input type="checkbox"/>	<input type="checkbox"/>
	NO, has never looked after finances	<input type="checkbox"/>	<input type="checkbox"/>
Is the person you care for too weak to carry out some day to day tasks (e.g. open a jar)?	YES	<input type="checkbox"/>	<input type="checkbox"/>
	NO	<input type="checkbox"/>	<input type="checkbox"/>

Please continue the questionnaire on page 6. Thank you.

Research and Ethics Board Version #2 - October 17, 2008

Frailty Estimation

How would you describe the state of health of the person you care for?

-  **Very fit.** (category 1)
People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.
-  **Well.** (category 2)
People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.
-  **Managing Well.** (category 3)
People whose medical problems are well controlled, but are not regularly active beyond routine walking.
-  **Vulnerable.** (category 4)
While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up", and/or being tired during the day.
-  **Mildly frail.** (category 5)
These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.
-  **Moderately frail.** (category 6)
People need help with all outside activities and with keeping house. They often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.
-  **Severely frail.** (category 7)
Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).
-  **Very Severely frail.** (category 8)
Completely dependent, approaching the end of life. Typically, they could not recover from minor illness.
-  **Terminally ill.** (category 9)
Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail.

Other Information Do you have any other information you think will be helpful for us?

Please record the time (Upon finishing this questionnaire). _____ AM / PM

Courtesy of the Geriatric Medicine Research Unit, Dalhousie University, Halifax, Nova Scotia