

Effectiveness of the Sub-Acute Care for Frail Elderly (SAFE) Transitional Care Unit on Short-Term Functional Independence in Frail Older Patients Discharged from Hospital



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ABSTRACT

Background

Transitional care programs help improve continuity of care and post-discharge outcomes for frail older adults who are hospitalized. In this study, we examined the effectiveness of a transitional care model, based in a long-term care (LTC) home, on the functional independence of older hospitalized patients post-discharge.

Methods

We used a propensity-score matched cohort, whereby cases comprised patients who were admitted to a transitional care program—called the Sub-Acute Care for Frail Elderly (SAFE) Unit—following a hospitalization between March 1, 2018 and June 30, 2019. Controls were matched to Usual Care patients discharged from hospitals within the same health region and accrual period who did not receive transitional care in the SAFE Unit. Outcomes included acute care, LTC, and home care use within six-month post-discharge.

Results

Compared to Usual Care, SAFE Unit patients were less likely to be admitted into an LTC home (RR 0.44, 95% CI 0.23–0.86) within six months post-discharge. Additionally, on average, SAFE Unit patients spent 34 fewer days in LTC homes than controls. SAFE Unit patients also incurred significantly fewer home care service days (median: 52 days, IQR: 12–132 days) than Usual Care patients (median: 65.5 days, IQR: 19–158 days), particularly in terms of their reliance on general nursing and personal support. Both groups had similar risks of six-month hospital readmission and having an ED visit.

Conclusion

Rehabilitative and restorative-focused care provided through transitional programs, such as the SAFE Unit, have the potential to enable independent living for older hospitalized patients discharged to the community.

Key words: transitional care, case-control studies, functional status, frailty, older adults

INTRODUCTION

In Canada, more than one-third of hospitalized seniors are considered frail, which leads them to be nearly three times more likely to be frequent users of hospital-based care and experience prolonged hospital stays of 30 days or longer.⁽¹⁾ They are also twice as likely to be readmitted to a hospital within 30 days of discharge.⁽¹⁾

In Canada, patients who no longer require the intensity of services provided in hospital settings, but remain in a hospital awaiting discharge to a more appropriate care setting, are labelled as requiring alternate level of care or ALC.^(2,3) With more than 35% of ALC patients comprising individuals who are 85 years of age or older, frail seniors with complex care needs are at the highest risk of being designated as ALC.⁽⁴⁾ Prolonged hospital stays have been shown to be associated with poorer health outcomes in older patients⁽⁵⁾ including functional decline,⁽⁶⁻⁸⁾ increased rates of hospital-acquired infections,⁽⁹⁾ increased stress and anxiety symptoms,^(7,10) and feelings of social isolation.⁽¹¹⁻¹³⁾ Despite the deleterious effects of prolonged hospital stays, for many older adults their frailty presents a challenge to care continuity as there

are often inadequate resources in the community to support patients who are medically complex.^(14,15)

Transitional care—sometimes referred to as intermediate care, post-acute care, or sub-acute care—provides continuity between acute care settings and a patient’s primary residence in the community or in a congregate care setting.^(16,17) These programs are often designed to help patients return to their homes by providing interdisciplinary care with a focus on functional ability and client-centred care planning.⁽¹⁸⁾ Existing studies suggest transitional care with a focus on restorative and rehabilitative care has the potential to enable functional independence and avoid hospital readmissions and institutionalization in older adults.^(16,18-21)

There have been increased investments in transitional care across Canada with the aim of supporting older adults’ return to home.^(19,22,23) However, there have been few evaluations of transitional care programs in Canada. A recent scoping review found a limited number of studies conducted in Canada,⁽¹⁸⁾ and the vast majority of studies focused on acute care-related outcomes (i.e., hospital readmission).⁽²⁴⁾ The effectiveness of transitional care on subsequent home care and long-term care (LTC) utilization, which are proxy measures for functional independence, is less known. This study aimed to examine the effectiveness of a Canadian-based restorative and integrated transitional care model on six-month use of acute care, home care, and admission to LTC (i.e., nursing) home following discharge from hospital.

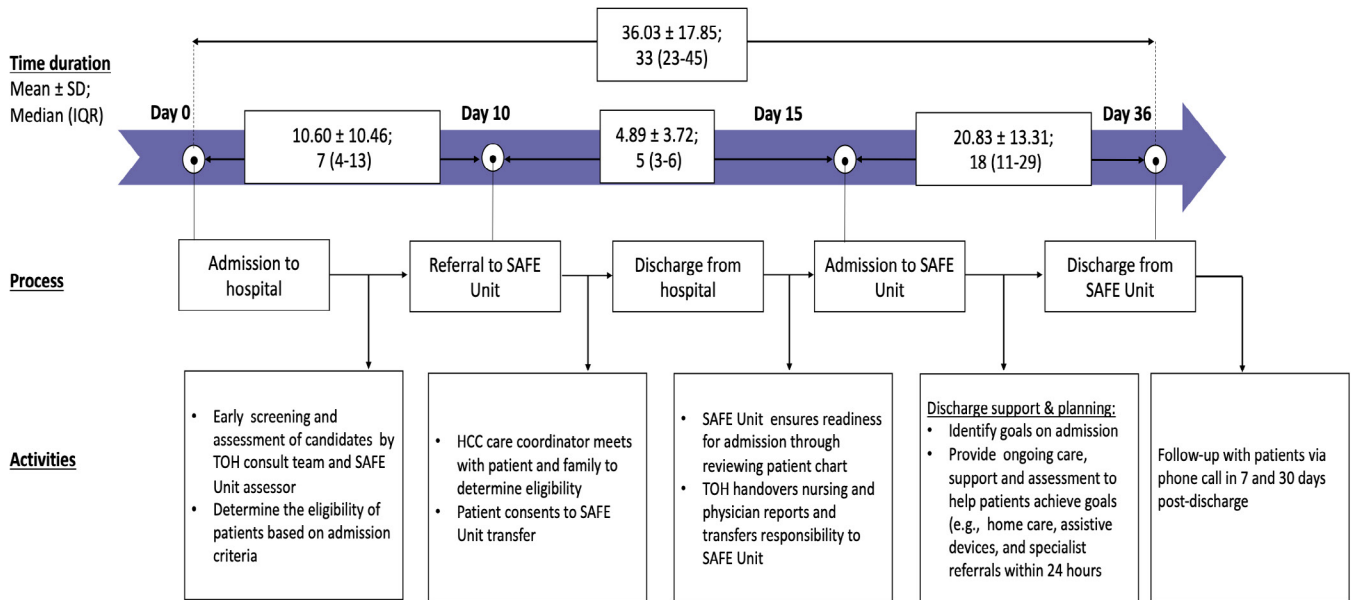
Health, a LTC home with 450 beds in Ontario, Canada. It is specifically designed for medically complex older adults, who are at a higher risk of deconditioning due to prolonged hospitalization⁽²⁵⁾ and require short-term (up to 30 days) restorative care.⁽²⁶⁾

In partnership with The Ottawa Hospital (TOH), this unique model of care has three main features: proactive, restorative and rehabilitative, and collaborative and integrated approach to care. When older patients are admitted to TOH, there is proactive assessment and screening of their functional capacity and rehabilitation potential. The results are shared by the care team at TOH with the staff in the SAFE Unit to determine if patients meet the eligibility criteria and could benefit from the program.⁽²⁵⁾ Eligibility for admission to the SAFE Unit is determined by the interdisciplinary team at Perley Health. Criteria for admission include: (a) being at least 60 years old; (b) capable of bearing weight; (c) requiring and can benefit from interdisciplinary care;⁽²⁷⁾ and (d) having defined and achievable rehabilitative/restorative care goals within 30 days and a discharge plan.⁽²⁸⁾ Once patients are considered medically stable for discharge and transferred to the SAFE Unit, they will receive interdisciplinary care consisting of nursing care, geriatrics care, physiotherapy, and allied health care with a focus on function preservation and holistic care that may include, for example, therapeutic recreation and creative arts programs.⁽²⁵⁾ The collaboration between TOH and Perley Health is the final and core component enabling patients to access this continuum of medical care from an interdisciplinary clinical team, from hospital to LTC home. The typical trajectory of hospitalized older patients, from eligibility assessment while in the hospital to discharge from the SAFE Unit, is provided in Figure 1.

METHODS

Setting

The Sub-Acute Care for the Frail Elderly (SAFE) Unit is a 0-bed transitional care unit located within Perley



Note: HCC=Home and Community Care; TOH=The Ottawa Hospital

FIGURE 1. The overall trajectory of patients who received care in the SAFE Unit

A previous study of the SAFE Unit by our research team focused on acute care and primary care use within 30 days post-discharge.⁽²⁶⁾ We demonstrated that frail older patients in the SAFE Unit had shorter length of stay in hospital and greater odds of being discharged to home. In this analysis, we extend the observation period to 180 days and include other important health-care outcomes, such as LTC home admission and the use of various types of home care services.

Study Design and Cohort

We designed a matched case-control study by linking patient-level data collected by the SAFE Unit team (for cases) to provincial-level health administrative data housed at ICES to identify controls. ICES is an independent and non-profit organization that houses population-level health and social data in Ontario. Cases included 154 patients admitted to the SAFE Unit post-discharge from a hospital stay between March 1, 2018 and June 30, 2019. Our control group comprised ALC (i.e., Usual Care) patients discharged from hospitals in the Champlain Local Health Integration Network (LHIN), the same health region where the SAFE Unit and Perley Health are situated. Usual Care patients were hospitalized within the same period as cases but did not receive transitional care in the SAFE Unit. Hospitalization records were derived from the Discharge Abstract Database (DAD).

To create the matched cohort, we first hard-matched the SAFE Unit and Usual Care patients based on their age and sex. Age and sex of Usual Care patients were derived from the Ontario Registered Persons Database (RPDB). Then, we generated propensity scores from a logistic regression model that included:

- the Johns Hopkins Adjusted Clinical Group (ACG)⁽²⁹⁾ as an indicator of patients’ medical complexity. Data comprising ICD-10 codes in the DAD and diagnostic codes from the Ontario Health Insurance Plan (OHIP) physician billing database, based on services/visits provided in the two years prior to the index date, were pulled and collapsed into 32 Aggregated Diagnosis Groups (ADGs) using the Johns Hopkins ACG® software (Version 10.0; <https://www.hopkinsacg.org/documents/version-10-0/>), which was then used to create the ACGs;
- geographic location of the patient’s primary residence, dichotomously defined as rural or urban, using postal code obtained from the RPDB;
- the number of prior acute care admissions recorded in the DAD in the six months before index hospitalization; and
- selected chronic conditions and diseases (congestive heart failure [CHF], chronic obstructive pulmonary disease [COPD], stroke, dementia, arrhythmia, lower respiratory tract infections [LRTIs]) known to be leading risk factors of hospital readmissions and LTC admission,^(30,31) which were defined using validated algorithms and relevant diagnostic codes in ICES datasets (see Table 1).

We used nearest-neighbour matching to pair cases and controls using a caliper width of 0.2 standard deviations

(SD).⁽⁴⁷⁾ We assessed the balance of characteristics between cases and controls by examining the distribution of measured baseline covariates (Table 2) and standardized differences. Standardized differences greater than 0.1 were interpreted as a potential imbalance in baseline characteristics between SAFE Unit and Usual Care patients.⁽⁴⁷⁾

Baseline Characteristics

The RPDB was used to capture baseline sociodemographic information (i.e., sex and age, rurality of residence, and neighbourhood income quintile). In addition to the variables captured in the propensity score matching, we also reported the prevalence of other relevant conditions, and number of chronic conditions (i.e., 0-2, 4, 5, 5, 6, 7+) to reflect the level of multimorbidity in this population (see Table 3); these include asthma, cancer, coronary heart disease, diabetes, hypertension, mood disorder, osteoarthritis, osteoporosis, renal failure, rheumatoid arthritis. The prevalence of these chronic conditions was ascertained using validated algorithms and relevant diagnostic codes in ICES datasets (see Table 1).

Outcomes

We captured health-care utilization of patients in the cohort who were alive for at least 180 days post-discharge, which included: emergency department (ED) visits using the National Ambulatory Care Reporting System; hospital readmissions using the DAD; follow-up consultations with family physicians using claims made to OHIP; LTC admission using records in the Continuing Care Reporting System; and home care visits using the Home Care Database, which were classified into all services, general or specialized nursing, personal support, and allied health care.

Statistical Analysis

We reported frequencies, proportions, means (SD), and medians (interquartile ranges [IQR]) to compare baseline characteristics and outcomes of interest between SAFE Unit and Usual Care patients. We calculated risk ratios (RRs) between SAFE Unit and Usual Care patients using McNemar paired Chi-square test; a *p* value of less than .05 was considered as statistically significant. For means and medians, a standardized difference of greater than 0.1 was considered as statistically significant. All analyses were performed using SAS 9.4 (SAS Institute, Inc., Cary, NC).

Ethics Approval

ICES is a prescribed entity under section 45 of Ontario’s Personal Health Information Protection Act. Section 45 authorizes ICES to collect personal health information, without consent, for the purpose of analysis or compiling statistical information with respect to the management of, evaluation or monitoring of, the allocation of resources to or planning for all or part of the health system. Projects conducted under section 45 and which have received approval by ICES’ Privacy and Legal Office, such as this one, do not require review by a Research Ethics Board.

RESULTS

Study Population Characteristics

Table 2 presents the sociodemographic and health profiles of patients who received care in the SAFE Unit and Usual Care patients after matching; baseline characteristics prior to matching are included in Table 4. The mean age of the matched cohorts was 82.5 ± 9.0 years at discharge. The majority of patients are female (61%) and more than 97% resided in an urban area. In terms of conditions that are associated with the highest risk of hospital readmission, CHF (55.8% for SAFE vs. 54.5% for Usual Care), COPD (33.1% vs. 30.5%), and LRTIs (31.8% vs. 30.5%) were the most prevalent conditions. Most SAFE Unit and Usual Care patients did not have an acute care admission within six months before the index hospitalization (64.9% vs. 66.2%). In terms of the discharge location, SAFE Unit patients were more likely to be discharged home without home support (56.8%), compared to the control group (7.9%; Table 5). All baseline covariates were well-balanced

with standardized differences that were less than or equal to 0.1. Additional baseline characteristics which were not used in the propensity score matching are reported in Table 3.

Post-Discharge Hospital Readmission, ED Visits, Primary Care Visits, & LTC Admission

As shown in Figure 2, over the 180-day post-discharge period, we did not find statistically significant differences between SAFE Unit and Usual Care patients with respect to their risk of hospital readmissions (RR 1.09, 95% CI 0.83–1.45), ED visits (RR 1.06, 95% CI 0.88–1.27), or primary care visits (RR 0.98, 95% CI 0.93–1.04). We observed a significantly lower risk of entering an LTC home, by 55%, among SAFE Unit patients relative to those who received Usual Care (RR 0.44, 95% CI 0.23–0.86).

As shown in Figure 3, SAFE Unit patients had a similar median length of stay (LOS) in the hospital (SAFE: median 14 days, IQR 5–27 days; Usual Care: median 11.5 days, IQR 8–26 days) and a similar number of ED visits (SAFE: median 2

TABLE 1.

Disease and other chronic conditions among SAFE Unit and Usual Care patients identified using algorithm developed in ICES databases

<i>Chronic Conditions</i>	<i>ICD-9 Codes^a</i>	<i>ICD-10 Codes</i>
Asthma ^e	493	J45
Arrhythmia ^f	427 (OHIP) ^b /427.3 (DAD) ^c	I48.0, I48.1
Cancer ^f	140-239	C00-C26, C30-C44, C45-C97
Congestive heart failure ^e	428	I500, I501, I509
Chronic Obstructive Pulmonary Disorder (COPD) ^e	491, 492, 496	J41, J43, J44
Coronary artery disease ^f	411-414	I20, I22-I25
Dementia ^{d,e}	290, 331 (OHIP)/046.1, 290.0, 290.1, 290.2, 290.3, 290.4, 294, 331.0, 331.5, F331.82 (DAD)	F00-F03, G30
Diabetes ^e	250	E08-E13
Hypertension ^e	401-405	I10-I13, I15
Mental health disorder ^f	291, 292, 295, 297, 298, 299, 301-307, 313, 314, 315, 319	F04, F050, F058-F064, F07, F08, F10-F29, F340, F35-F37, F430, F439, F453, F454, F458, F46-F52, F531, F538, F539, F54-F67, F681, F688, F69-F92, F931, F932, F933, F938, F939, F94-F98
Osteoarthritis ^f	715	M15-M19
Osteoporosis ^f	733	M81, M82
Renal failure ^f	403, 404, 584, 585, 586, v451	N17, N18, N19, T82.4, Z49.2, Z99.2
Stroke ^f	430, 431, 432, 434, 436	I60-I64
Mood disorder ^f	296, 300, 309, 311	F30-F34, F38-F42, F43.1, F43.2, F43.8, F44, F45.0, F45.1, F45.2, F48, F53.0, F68.0, F93.0, F99
Rheumatoid arthritis ^f	714	M05, M06

^a ICD = International Classification of Disease

^b OHIP = Ontario Health Insurance Plan; contains claims of Ontario's residents under insurance coverage information from health care provider (e.g., physicians)

^c DAD = Discharge Abstract Database; contains demographic, clinical, and administrative information for inpatient hospital admissions

^d identified through prescription of Cholinesterase inhibitors in Ontario Drug Database (ODB), in addition to ICD codes; ODB contains prescribed drug claims for Ontario's residents aged 65 years and older

^e These conditions are identified through validated algorithms in ICES databases⁽³²⁻³⁸⁾

^f These conditions are identified though at least one diagnosis recorded in DAD or two diagnoses recorded in OHIP⁽³⁹⁻⁴⁰⁾

visits, IQR 2–4 visits; Usual Care: median 2 visits, IQR 1.5–4 visits) as Usual Care patients within 180 days post-discharge. However, SAFE Unit patients had significantly fewer primary care visits (SAFE: median 7 visits, IQR 3–14 visits; Usual Care: median 13 visits, IQR 5–25 visits) and spent fewer days in an LTC home (SAFE: median 46 days, IQR 24.5–82.5 days; Usual Care: median 85 days, IQR 45–142 days) than those who received Usual Care.

Post-Discharge Home Care Use

Overall, SAFE Unit and Usual Care group patients had a similar likelihood of using any home care within 180 days post-discharge (RR 1.04, 95% CI 0.94–1.16, Figure 4). SAFE Unit patients were slightly more likely to require general nursing care (RR 1.22, 95% CI 0.91–1.64) as well as allied health-care support (RR 1.01, 95% CI 0.82–1.25), though these were not statistically significant differences. Meanwhile,

SAFE Unit patients were less likely to need specialized nursing care (RR 0.79, 95% CI 0.48–1.30) and personal support (RR 0.90, 95% CI 0.74–1.09). These differences were, again, not statistically significant.

As shown in Figure 5, among those who used home care, on average, SAFE Unit patients had used significantly fewer days of service than those who received usual care; specifically, SAFE Unit patients had a median of 52 service days (IQR 12–132 days), compared to a median of 65.5 service days (IQR 19–158 days) among Usual Care patients. In terms of specific home-care services, we found significant differences in general nursing (SAFE: median 16.5 days, IQR 6–33 days; Usual Care: median 16 days, IQR 5–35 days) and personal support use (SAFE: median 75 days, IQR 27–164 days; Usual Care: median 80 days, IQR 31–151 days). The median number of service days did not differ in other categories of home-care services (i.e., specialized nursing and allied health care).

TABLE 2.
Baseline characteristics of SAFE Unit and Usual Care patients, following propensity score matching

Characteristics	SAFE Unit, n(%)		Usual Care, n(%)		Standardized Differences
	N = 154		N = 154		
Age (in years)					
Mean ± SD	82.47 ± 9.03		82.47 ± 9.02		0.00
60-64	1-5 ^a	(0.6-3.2)	1-5 ^a	(0.6-3.2)	0.00
65-69	10-14 ^a	(6.5-9.1)	10-14 ^a	(6.5-9.1)	0.00
70-74	17	(11.0)	16	(10.4)	0.02
75-79	26	(16.9)	27	(17.5)	0.02
80-84	26	(16.9)	25	(16.2)	0.02
85-89	34	(22.1)	34	(22.1)	0.00
90+	36	(23.4)	37	(24.0)	0.02
Sex					
Female	94	(61.0)	94	(61.0)	0.00
Male	60	(39.0)	60	(39.0)	0.00
Rural					
Yes	1-5 ^a	(0.6-3.2)	1-5 ^a	(0.6-3.2)	0.04
No	149-153 ^a	(96.8-99.4)	149-153 ^a	(96.8-99.4)	0.04
Comorbidities					
Arrhythmia	37	(24.0)	37	(24.0)	0.00
CHF	86	(55.8)	84	(54.5)	0.03
COPD	51	(33.1)	47	(30.5)	0.06
Dementia	27	(17.5)	28	(18.2)	0.00
Stroke	15	(9.7)	8	(5.2)	0.08
ACG score					
Mean ± SD	13.70 ± 3.24		13.78 ± 3.16		0.05
LRTI during index hospitalization	49	(31.8)	47	(30.5)	0.03
Prior acute care admission (within 6 months prior to index)					
0	100	(64.9)	102	(66.2)	0.03
1	36	(23.4)	34	(22.1)	0.03
2+	18	(11.7)	18	(11.7)	0.00

^aResults in these cells were suppressed due to the concern of re-identification.

CHF = Congestive Heart Failure; COPD = Chronic Obstructive Pulmonary Disease; ACG = Adjusted Clinical Group; LRTI = Lower Respiratory Tract Infection.

DISCUSSION

In this study, we found that patients who were admitted to the SAFE Unit were significantly less reliant on follow-up care in the community. This was demonstrated by having fewer primary care visits and fewer home-care service days, especially for home-based personal support, than Usual Care patients. Furthermore, patients who received care in the SAFE Unit had significantly lower odds of entering LTC than those who received usual care. Among patients who required care in LTC homes, SAFE Unit patients spent fewer days in LTC within the 180-day observation period, indicating a delayed admission compared to those who received usual care. Delayed admission to LTC, combined with fewer home care service days—particularly in terms of personal care and support—may indicate that care provided in the SAFE Unit optimized the functional independence of hospitalized older patients who were supported through this model.

These observations echo existing evidence on the effectiveness of transitional care units,^(15,18,48,49) which tend to suggest a positive association between transitional care and improvements in functional status,^(16,18,48) as well as reduced home-care use among older adults.^(15,50-52) The unique features of the SAFE Unit—including cognitive

screening, comprehensive frailty assessment, as well as rehabilitation- and restorative-focused treatment—are key contributors to the observed outcomes.⁽²⁵⁾ The initial design of the SAFE Unit was modelled after the Acute Care for Elders (ACE) Unit at a local hospital in Cleveland, Ohio. The ACE Unit, which adopted a patient-centred, multidimensional assessment and care planning approach, was set up to prevent functional deterioration and enable restoration of functional independence in frail older adults.^(53,54) In a randomized controlled trial of ACE, the investigators found that functional decline from baseline and nursing home placement were less frequent in the intervention group at discharge and during the year following hospitalization.⁽⁵⁵⁾ In a similar evaluation of a national transitional care program in Australia—which provides short-term, interdisciplinary, rehabilitative- and restorative-focused care to older patients in residential settings (i.e., nursing home)—the investigators found improved functional independence upon discharge from the program.⁽¹⁹⁾

Functional decline is a common concern for older adults who experience extended stay and delayed discharge from the hospital.⁽⁵⁶⁾ Therefore, preventing further deterioration towards critical frailty and functional decline in this population is particularly important to mitigate their need for more

TABLE 3.
Additional sociodemographic and health characteristics not used in propensity score matching

<i>Characteristics</i>	<i>SAFE Unit, n(%)</i>		<i>Usual Care, n(%)</i>		<i>Standardized Differences</i>
	<i>N=154</i>		<i>N=154</i>		
Neighbourhood income quintile					
1	34	(22.1)	29	(18.8)	0.08
2	42	(27.3)	31	(20.1)	0.17
3	33	(21.4)	37	(24.0)	0.06
4	16	(10.4)	23	(14.9)	0.14
5	29	(18.8)	34	(22.1)	0.08
Comorbidities					
Asthma	39	(27.4)	37	(33.2)	0.03
Cancer	58	(39.5)	51	(34.7)	0.10
Coronary heart disease	68	(46.3)	67	(42.1)	0.01
Diabetes	65	(42.1)	61	(44.2)	0.05
Hypertension	138	(89.5)	140	(88.4)	0.04
Mood disorder	38	(23.7)	44	(27.4)	0.09
Osteoarthritis	123	(80.0)	123	(82.6)	0.00
Osteoporosis	23	(15.8)	20	(21.1)	0.06
Renal failure	83	(50.5)	62-66	(40.3-42.9)	0.25
Rheumatoid arthritis	11	(7.4)	1-5	(0.6-3.2)	0.25
Number of Prevalent Conditions					
0-2	1-5	(0.6-3.2)	1-5	(0.6-3.2)	0.00
3	5-10	(3.2-6.5)	5-10	(3.2-6.5)	0.10
4	14	(10.0)	21	(8.4)	0.14
5	15	(11.1)	18	(13.7)	0.06
6	28	(18.9)	28	(16.3)	0.00
7+	89	(54.7)	76	(56.3)	0.17
Presence of Infections	62	(42.1)	52	(36.3)	0.13

TABLE 4.
Sociodemographic and health characteristics of patients who received care
in the SAFE Unit and Usual Care, before propensity score matching

Characteristics	SAFE Unit, n(%)		Usual Care, n(%)		Standardized Difference
	N=155		N=3,336		
Age	82.49 ± 9.00		79.95 ± 9.68		
Mean ± SD					
60-64	1-5	(0.6-3.2)	242	(7.3)	0.18
65-69	10-14	(6.5-9.1)	336	(10.1)	0.13
70-74	17	(11.0)	435	(13.0)	0.06
75-79	26	(16.8)	492	(14.7)	0.06
80-84	26	(16.8)	615	(18.4)	0.04
85-89	35	(22.6)	619	(18.6)	0.1
90+	36	(23.1)	597	(17.9)	0.13
Sex					
Female	95	(61.3)	1,972	(59.1)	0.04
Male	60	(38.7)	1,364	(40.9)	0.04
Rural					
Yes	1-5	(0.6-3.2)	325	(9.7)	0.34
No	150-154	(96.8-99.4)	2,981	(89.4)	0.36
Comorbidities					
Arrhythmia	38	(24.5)	386	(11.6)	0.34
Congestive heart failure (CHF)	87	(56.1)	936	(28.1)	0.59
Chronic obstructive pulmonary disorder (COPD)	52	(33.5)	678	(20.3)	0.3
Dementia	24	(15.5)	1,170	(35.1)	0.46
Stroke	12	(7.7)	497	(14.9)	0.23
Asthma	40	(25.8)	652	(19.5)	0.15
Cancer	59	(38.1)	888	(26.6)	0.25
Coronary heart disease	69	(44.5)	1,066	(32.0)	0.26
Diabetes	66	(42.6)	1,320	(39.6)	0.06
Hypertension	139	(89.7)	1,747	(52.3)	0.21
Mood disorder	39	(25.2)	930	(27.9)	0.06
Osteoarthritis	124	(80.0)	2,565	(76.9)	0.08
Osteoporosis	23	(14.8)	626	(18.8)	0.11
Renal failure	84	(54.2)	971	(29.1)	0.53
Rheumatoid arthritis	12	(7.7)	164	(4.9)	0.12
ACG score					
Mean ± SD	13.74 ± 3.27		12.86 ± 3.47		0.26
Lower respiratory tract infections during index hospitalization	50	(32.3)	467	(14.0)	0.44
Prior acute care admission (within 6 months prior to index)					
0	101	(65.2)	2,517	(75.4)	0.23
1	36	(23.2)	605	(18.1)	0.13
2+	18	(11.6)	214	(6.4)	0.18
Number of prevalent conditions					
0-2	1-5	(0.6-3.2)	233	(7.0)	0.25
3	5-10	(3.2-6.5)	266	(8.0)	0.21
4	14	(9.0)	440	(13.2)	0.13
5	15	(9.7)	525	(15.7)	0.18
6	28	(18.1)	512	(15.3)	0.07
7+	90	(58.1)	1,360	(40.8)	0.35
Presence of infections	63	(40.6)	574	(17.2)	0.54

TABLE 5.
Discharge location of patients who received care in the SAFE Unit and Usual Care

Characteristic	SAFE Unit Patient, N (%)	ALC Patients, N (%)	Standard Difference
	N=190	N=190	
Home with Support	23 (12.1%)	81 (42.6%)	0.73
Home without support	108 (56.8%)	15 (7.9%)	1.23
Other	1 (0.5%)	0 (0.0%)	0.1
Rehabilitation facility	2 (1.1%)	0 (0.0%)	0.15
Retirement home	28 (14.7%)	21 (11.1%)	0.11

institutional care.⁽⁵⁷⁾ Not only is maintaining older adults’ independence at a level where they are able to remain living at home aligned with most seniors’ preferences when considering their place of residence and care,⁽⁵⁸⁾ this could have important implications from a health system perspective as well, in terms of reducing the relatively higher cost associated with residential care while increasing capacity within hospitals. In a parallel study conducted by our research team, we examined the cost-effectiveness of the SAFE Unit in enabling institution-free days at home. We demonstrated that SAFE Unit patients had incurred a lower total cost of care (by approximately \$1,100 in 2019 Canadian dollars), owing to their reduced hospital length of stay.⁽⁵⁹⁾ Patients who received care in the SAFE Unit also spent more institution-free days

at home within six months post-discharge. Therefore, it was deemed to be a cost-effective model of care.

Limitations

We acknowledge that our study has limitations. First, we used the likelihood and days of LTC and home care service utilization as indications of functional independence, which is an inferred effect rather than an objective measure of functional independence using a standard measurement scale, such as the modified Barthel Index.⁽¹⁸⁾ The lack of available services may contribute to a person not receiving care, and not because the patient is functionally independent. Second, our use of a quasi-experimental design also has limitations. While we were able to match cases and controls using a variety of factors (e.g., age, sex, morbidity, and ACG score) that are relevant to the outcomes of interest, these do not represent a comprehensive depiction or measurement of the patients’ frailty or overall health stability. As such, there may be unobserved and clinically meaningful differences between the cases and controls that we did not control for in our matching algorithm. For example, there may be individuals in the Usual Care group who are incapable of bearing weight and have limited rehabilitative/restorative potential, and they would not have qualified for the SAFE Unit even if this care option was available to them. Unfortunately, we are unable to assess the magnitude of potential bias using health administrative data sources due to the unavailability of information pertaining to general frailty and weight-bearing status. Despite this, the potential bias may be small, as studies comparing the ACG to other clinical frailty instruments suggest similar performance in predicting various health outcomes.⁽⁶⁰⁻⁶³⁾

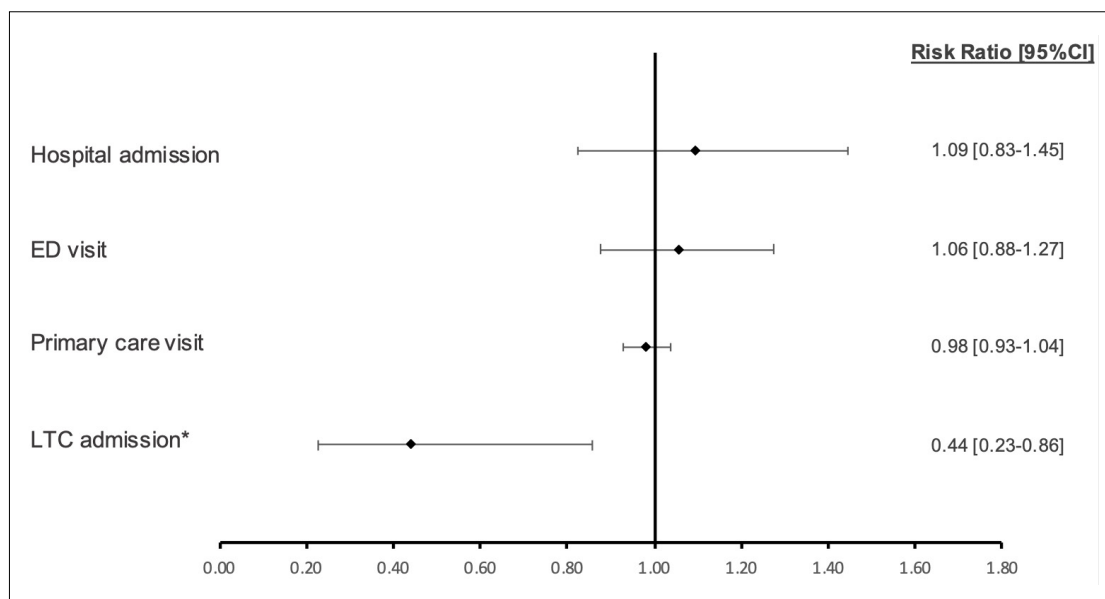


FIGURE 2. Relative risk of a hospital readmission, emergency department (ED) visit, primary care visit, and long-term care (LTC) admission within 180 days post-discharge in SAFE Unit compared to Usual Care patients

*Denotes statistical significance at $p < .05$.

CONCLUSION

Function-focused transitional care models, like the SAFE Unit, have the potential to enable older adults to live independently without relying on significant community-based resources and delays their entry into LTC homes. In

order to holistically address an older patient’s needs, transitional care programs must include a comprehensive frailty assessment, care planning by a multidisciplinary team that involves patients and families, mobility and rehabilitation-focused treatments, discharge planning, and patient, family

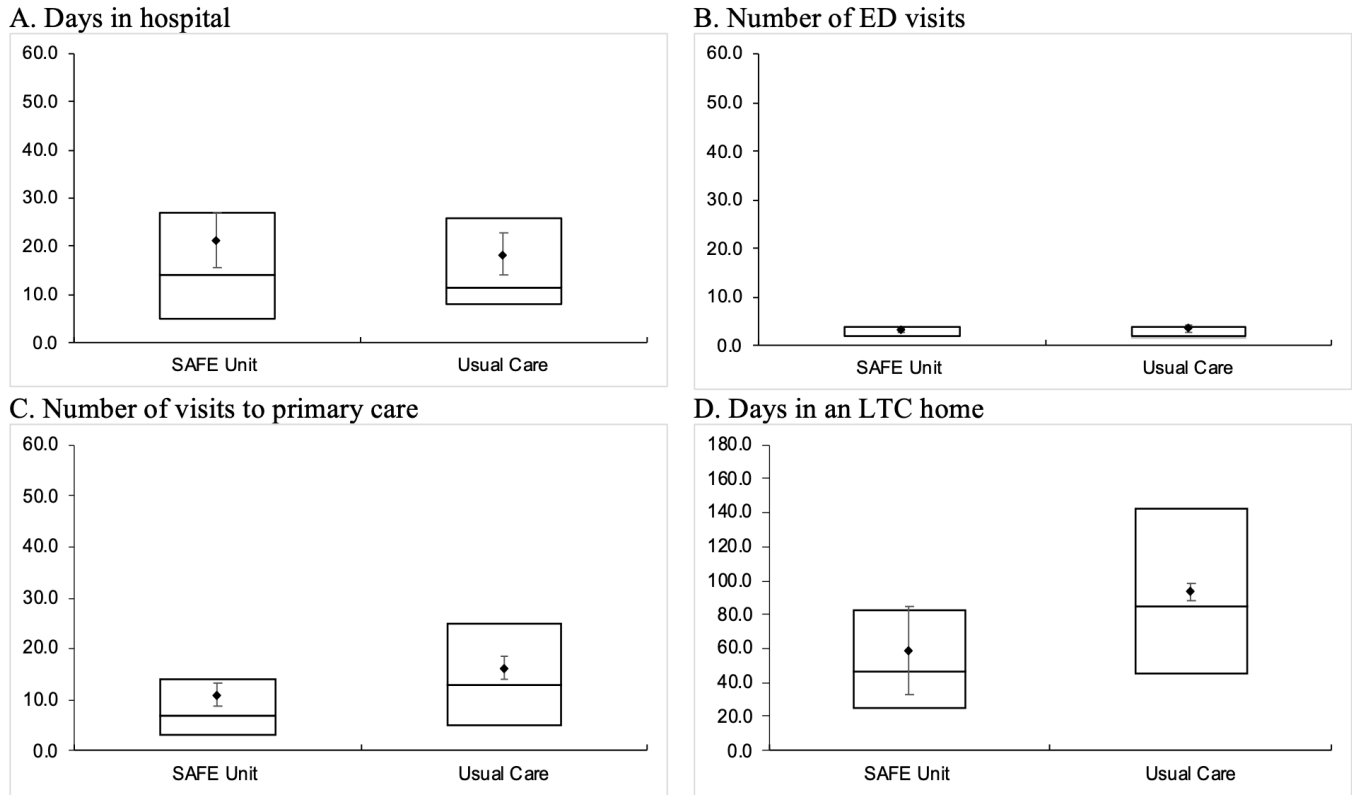


FIGURE 3. Length of stay (in days) of hospitalization and in long-term care (LTC), and number of visits to the emergency department (ED) and primary care providers within 180 days post-discharge in SAFE Unit and Usual Care patients
ED = Emergency Department; LTC = Long-term Care.

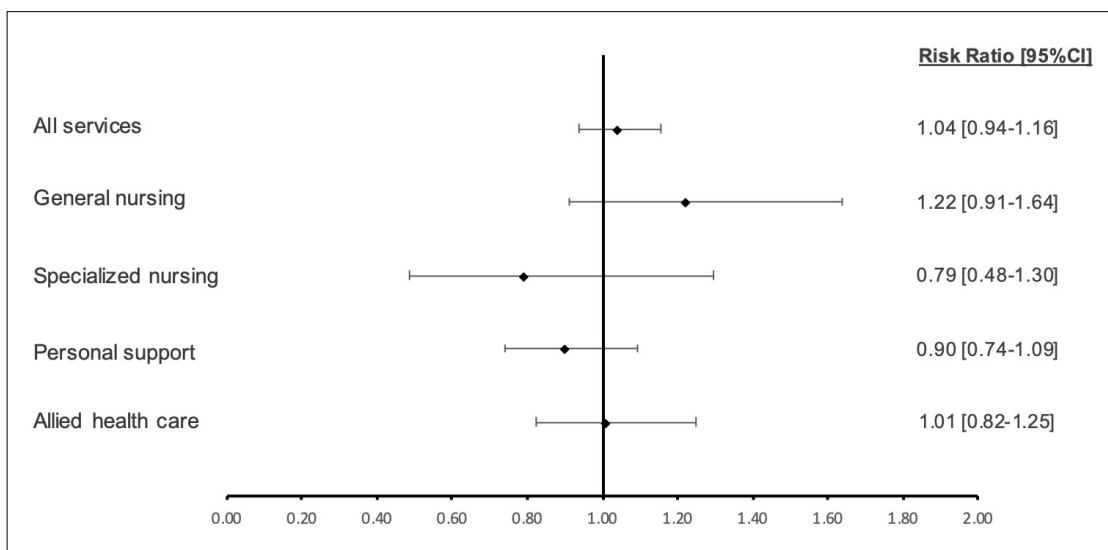


FIGURE 4. Relative risk of requiring various home-care services within 180 days post-discharge in SAFE Unit and Usual Care patients

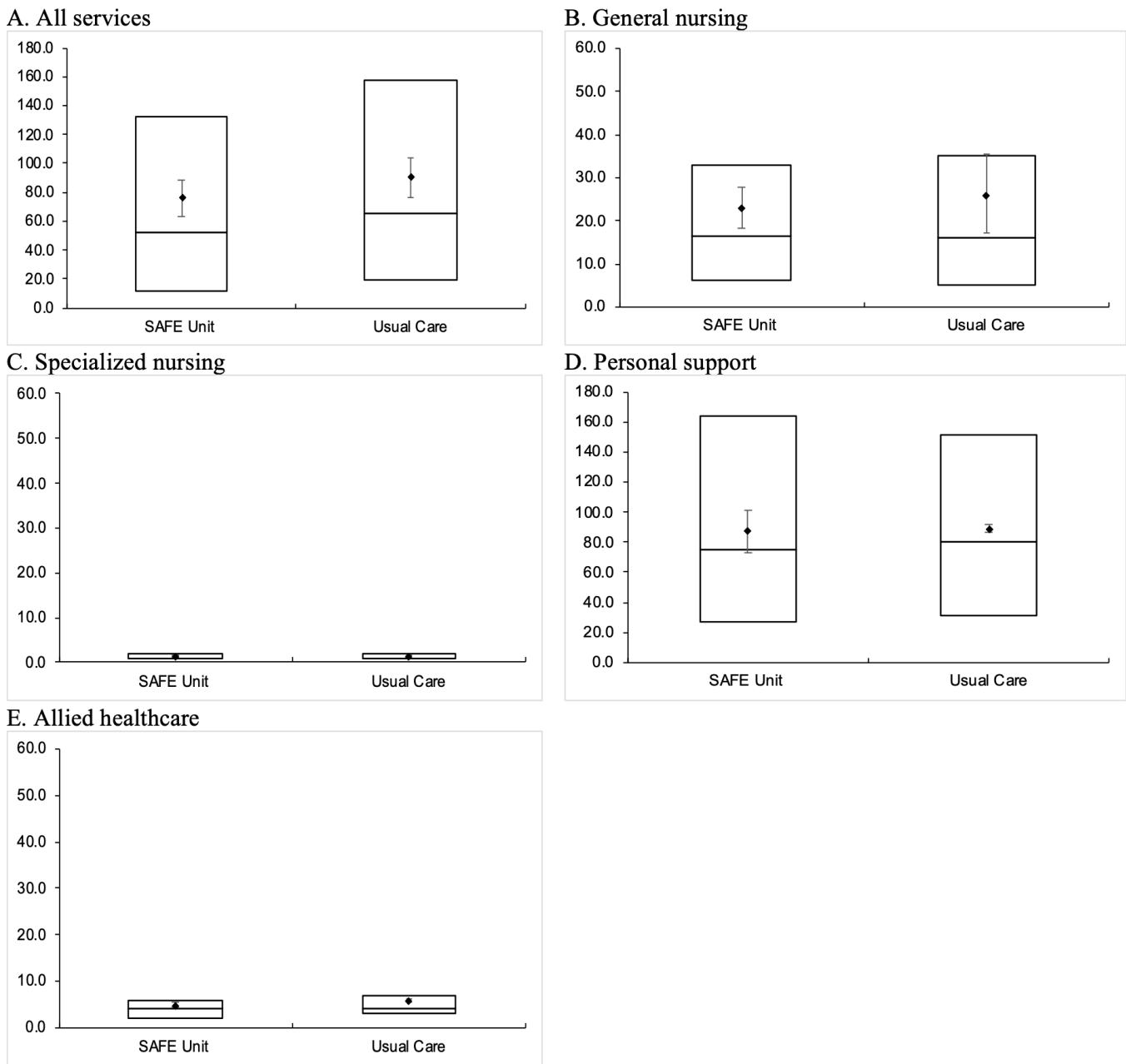


FIGURE 5. Number of service days associated with various home-care services utilized by SAFE Unit and Usual Care patients within 180 days post-discharge

and staff education. Despite these promising findings, the continued investment in transitional care in Ontario and elsewhere within Canada should be supported by rigorous evaluations of their effectiveness. Future work would benefit from a formal evaluation framework to guide the assessment of similar transitional care models.

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CONFLICT OF INTEREST DISCLOSURES

We have read and understand the *Canadian Geriatrics Journal's* policy on disclosing conflicts of interest and declare that we have none.

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