

# Facilitating Equitable Subacute-to-Home Transitions for Patients Receiving Palliative and/or End-of-Life Care: A Literature Review

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## Abstract

**Introduction:** As people in subacute facilities approach the end of life, the focus of their care often shifts to comfort as they seek to return home. Interventions that aim to improve hospital-to-home transitions do not generally focus on subacute care. **Objective:** To summarize the existing literature on subacute-to-home transitions for individuals receiving palliative care near the end of life, and to explore whether these interventions are targeted toward marginalized groups to improve their transition experience. **Methods:** We searched the MEDLINE, Embase, HealthSTAR, and Cochrane Library electronic databases using terms related to end of life, palliative care, and transitions from subacute facilities to home. We identified 896 records and included 29 articles, 11 of which were intervention articles. We searched the 11 intervention articles for equity stratifiers. **Results:** Of the 29 included articles, four addressed transitions for end-of-life populations, three discussed family caregiver perspectives, and 11 were intervention studies, including regular home visit follow-ups, individualized transition care plans, and an individualized intervention with an advanced practice nurse. Subacute-to-home interventions showed positive outcomes such as reduced risk of hospital readmissions, reduced length of stays, and improved functional status. However, study limitations included small sample sizes, inconsistent definitions of outcomes, and incompleteness due to COVID-19. No studies focused on marginalized groups. **Conclusion/Discussion:** While there was some literature supporting targeted interventions for subacute-to-home transitions for those receiving palliative care or end-of-life care, the included interventions did not target marginalized groups. Further research in these areas is required.

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## Introduction

In an aging population, increasing numbers of individuals experience extended periods with frailty and multimorbidity toward the end of life (Tunnard et al., 2021). Subacute settings provide specialized levels of care to patients with longer periods of frailty, deterioration, and complex conditions who do not require the intensity of care provided in acute settings (Menzies & Hanger, 2011; Reyes-Ortiz et al., 2015; Robert et al., 2021; Sinn et al., 2016; Tunnard et al., 2021; Walker et al., 2015). Subacute care aims to provide continuity of care for patients as an intermediate step between acute care and home (Robert et al., 2021). However, while interventions exist to improve the hospital-to-home transition, these have generally focused on acute care. There is a need to tailor interventions to this group of patients receiving subacute care, as they may seek to return home, when possible.

Subacute-to-home transitions can be distressing and logistically challenging, especially when patients are near the end of life. Problems with discharge quality, planning, and preparation contribute to poor subacute-to-home transition outcomes (Masel et al., 2014; Menzies & Hanger, 2011; Middleton et al., 2018; Robert et al., 2021; Rose et al., 2021; Zhang et al., 2017). For example, patients may not have access to appropriate resources such as information about equipment for the transition home or to support them in remaining at home (Premier's Council on Improving Healthcare and Ending Hallway Medicine, 2019). Patients and caregivers have reported that they are often unaware of available transitional care programs that assist with planning, preparation, and resource provision for transitions home from subacute facilities (Walker et al., 2015). When poorly handled, these transitions can have significant negative effects on the physical, psychosocial, and spiritual well-being of patients and family caregivers (Coleman et al., 2004; Killackey et al., 2020; Li et al., 2014; Saunders et al., 2019; Scott et al., 2020; Sinn et al., 2016; Tunnard et al., 2021; Wilson & Birch, 2018). Furthermore, without proper support,

patients transitioning between care settings at the end of life may be vulnerable to medical complications (Killackey et al., 2020; Saunders et al., 2019; Wilson & Birch, 2018), hospital readmissions (Coleman et al., 2004; Li et al., 2014), and extended stays in subacute care (Reyes-Ortiz et al., 2015; Santa-Emma et al., 2002).

Harold Freeman's patient navigation model suggests that interventions should promote access to health care services (e.g., patient navigation services) for marginalized groups because they are at greatest risk of adverse outcomes connected to barriers in accessing care (Freeman & Rodriguez, 2011). For example, a previous systematic review reports that interventions addressing the transition from acute hospital-to-home care have often excluded participants with comorbidities and non-cancer diagnoses (Piraino et al., 2012). However, patients with non-cancer diagnoses are at greater risk for hospitalizations, emergency department visits, and death in-hospital following discharge, compared to patients diagnosed with cancer (Webber et al., 2020). Additionally, patients with linguistic minority status have a higher risk of hospital readmission after discharge in comparison to patients who speak English (Squires et al., 2022), and non-white patients have a higher risk of using acute care after discharge in comparison to white patients (Hall et al., 2015). Furthermore, inequities in access to palliative care and health outcomes have been observed between marginalized groups (i.e., groups with different demographic characteristics such as race/ethnicity, sex, gender, income level, linguistic minority status, geography, sexual orientation, etc.; Canadian Institute for Health Information, 2018; Isenberg et al., 2022; Johnson, 2013; Tyler et al., 2014; Yarnell et al., 2020; Yarnell et al., 2017). Accordingly, understanding subacute-to-home transitions necessitates an equity lens to explore the barriers to accessing care noted above.

Our research program on transitions from hospital to home in palliative care shows that the subacute-to-home transition is an important part of the care experience. Previous

studies have systematically reviewed the literature on transitional care programs (from acute care to home) and outcomes such as rehospitalization (Albert, 2016; Killackey et al., 2020; Morkisch et al., 2020; Saunders et al., 2019; Scott et al., 2020), populations targeted by transitional care programs (Piraino et al., 2012), transitional care programs for older adults with frailty (Lee et al., 2022), and the experiences of health care providers in palliative care transitions from acute care to home (Killackey et al., 2020). Donabedian (1988, 2005) classifies variables under the categories of structure, processes, and outcome, which can be used to evaluate the effective delivery of health care and is a well-accepted approach to organizing indicators and outcomes. Similarly, leading and lagging indicators have been used (primarily in occupational health and safety research) to measure organizations' safety performance (Shea et al., 2016; Sheehan et al., 2016). In the context of our study, we used these categories to classify the indicators and outcomes that were found in this review. We were interested in the indicators and outcomes measured before and after the transition home from a subacute facility, as well as indicators that were reported about the organization of the health care system overall. Furthermore, we wanted to see how intervention articles had reported indicators or outcomes for marginalized groups (Freeman & Rodriguez, 2011).

To our knowledge, there has been only one systematic review focused on interventions that aim to improve subacute transitions, completed in Australia (Davis et al., 2016). The current literature review expands on this systematic review (Davis et al., 2016) by summarizing any literature on subacute-to-home transitions for people receiving palliative care and/or near the end of life, the populations they include, and the indicators and outcomes measured. We also explore whether these interventions have been targeted toward marginalized groups to improve their transition experience.

## **Objective**

We aim to summarize the existing literature on the transition from subacute facilities to home for individuals receiving palliative care and/or near the end of life. We included studies that had any kind of comparator and outcomes reported. We also aim to explore whether any interventions included in this review have been targeted toward marginalized groups to improve their transition experience.

## **Methods**

### **Search Strategy**

We conducted three distinct, and yet complementary, searches (detailed below). As we searched the literature, we found that very few articles simultaneously used the term "subacute facilities" while focusing on end-of-life populations (in Searches 1 and 2). We expanded on Search 1 by including synonyms for "subacute facilities" in Search 2 and next by removing the term "end of life" in Search 3 to capture all subacute-to-home transitions beyond only those occurring at the end of life.

#### **Search 1**

We conducted a preliminary search of the MEDLINE (via Ovid) electronic database using terms related to "end of life" and palliative care, subacute care, and transition and discharge from subacute facilities to home. Search terms were developed with the assistance of a research librarian at the University of Ottawa who determined the best MeSH terms to use alongside text words when searching articles (see Appendix A for search terms used). Search 1 resulted in 70 articles to screen (see Figure 1 for PRISMA diagram).

#### **Search 2**

For Search 2 of the MEDLINE (via Ovid) electronic database, we included synonyms for subacute facilities in addition to our original search terms. In Search 1, we found that some studies used synonyms for subacute facilities

and that countries outside Canada referred to subacute care using different terminology, such as “complex continuing care” and “rehabilitation care.” We also screened the reference lists of articles from Search 1 to broaden our search for synonyms for subacute facilities. Additionally, we added the search term “frailty” to our search, since it often appeared in articles that focused on the palliative/end-of-life population (see Appendix A). Reference lists of included articles were screened to further identify any relevant articles. Search 2 resulted in 267 additional articles to screen.

### **Search 3**

Our final search used the added synonyms for subacute care and the term “frailty”; however, we removed the term “end of life,” as few articles had explored end-of-life populations and subacute-to-home transitions in Search 2 (see Appendix A). We searched electronic databases including Embase, HealthSTAR, and the Cochrane Library database via Ovid in addition to MEDLINE. Search 3 was conducted in February 2023 and resulted in 559 additional articles to screen.

### **Screening**

We downloaded the search results into EndNote (Ver. 20.2.1, <https://endnote.com/>) and removed duplicate articles and articles not in English (see Figure 1). From 896 records that were identified from Searches 1–3, 526 records were excluded. Two reviewers (MM and LA) screened 370 included abstracts for relevancy and independently assessed 118 full text articles using the inclusion and exclusion criteria. Any conflicts were discussed with the rest of the authors.

### **Inclusion and Exclusion Criteria**

Inclusion criteria are the following:

- discussed subacute-to-home transition (“home” refers to home, inpatient hospice, retirement home, or group home)
- written in English
- no date restriction

- focused on adults 18 years and older

Exclusion criteria are the following:

- written in a language other than English
- discussed a transition within a hospital/between units in a hospital, or a transition to a long-term care facility, or a transition from home to hospital
- discussed acute care transition or discharge

### **Data Extraction**

Twenty-nine articles were included for data extraction. (See Figure 1). MM, LA, and AD performed data extraction, populating a data abstraction table in Microsoft Excel. Table headings included population, setting, date and country of publication, type of intervention (if applicable), methodology, main findings, and statistical outcomes.

Additionally, we assessed the intervention articles using an equity lens. MM screened the 11 full text articles for equity stratifiers (i.e., demographic characteristics such as race, ethnicity, Indigeneity, sex, gender, income level, linguistic minority status/language, and sexual orientation).

### **Analysis**

Articles were summarized using a narrative synthesis approach. The population and interventions were discussed and structured into themes. The indicators and outcome measures from the included articles were also organized into the categories of structure, process or leading indicators, and outcome or lagging indicators. All authors interpreted the findings together.

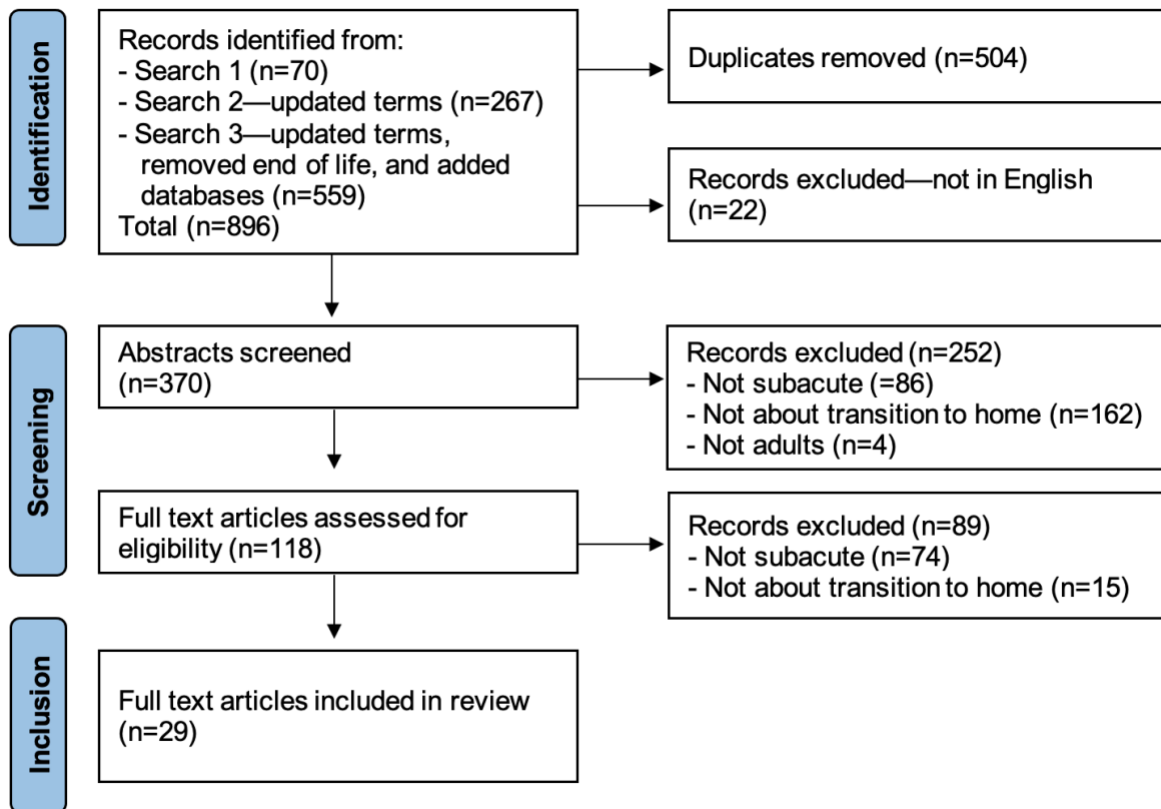
The indicators that fall into the structure category are the organizational inputs and framework of the health care system or the “settings in which care occurs,” (e.g., medical staff organization or resources; Donabedian, 1988, p. 1745; Donabedian, 2005; NHS England,

2021). Donabedian defined process measures as the activities performed in the health care system to deliver care that aims to achieve a desired outcome (e.g., referrals, admissions, or treatments; Donabedian, 1988, 2005; NHS England, 2021). Similarly, leading indicators are upstream or precursors to downstream outcomes (Shea et al., 2016; Sheehan et al., 2016). Outcomes are a measurement of health status, the end result of health care processes,

and are often used as an indicator of how well a system is performing. Examples include mortality, hospital admissions, and patients' satisfaction with care (Donabedian, 1988, 2005; NHS England, 2021). Similarly, lagging indicators are downstream health effects or the end result of health care processes, and are the most common outcomes for researchers to measure (Shea et al., 2016; Sheehan et al., 2016).

**Figure 1**

*PRISMA Diagram Depicting Search Process for Literature Review*



Note. PRISMA diagram as per Page et al. (2021).

## Results

Below we summarize the existing literature on subacute-to-home transitions via descriptions of the articles, including the study populations, interventions, and indicators/outcomes.

## Description of Included Articles

The 29 articles were published between 1995 and 2023, with the majority (76%) published within the past 10 years. The articles originated from 11 different countries: 10 from

the United States, five from Canada, three from Australia, two each from England, Japan, and Austria, and one each from Denmark, Germany, New Zealand, Switzerland, and Turkey. The number of participants in each article varied from one to 14,072 participants, and included various participant groups, such as patients, family caregivers, bereaved families, and health care providers. Most articles (n=22) did not specifically look at a certain disease population. However, when disease populations were reported, the articles included patients with cancer (Aso et al., 2022; Masel et al., 2014, 2015; Zhang et al., 2017), chronic illness (Lenaghan, 2019), dementia (Lenaghan, 2019), or hip fracture (Nikolaus et al., 1999).

The articles used various synonyms for subacute care such as inpatient rehabilitation facilities, long-term acute care, tertiary referral centres, inpatient intermediate care units, inpatient palliative care units, skilled nursing facilities, subacute geriatric units, transition care programs, or complex continuing care programs.

The patient population for most articles was aged 65 years or older. Studies reporting patient inclusion criteria generally included patients with a life expectancy of less than six months or a Palliative Performance Scale (PPS) score that was less than 50% (Reyes-Ortiz et al., 2015; Shinall et al., 2019). Four articles addressed transitions home for end-of-life populations (Aso et al., 2022; Reyes-Ortiz et al., 2015; Santa-Emma et al., 2002; Toles et al., 2021).

Three articles included the perspective of caregivers and family members (Aso et al., 2022; Menzies & Hanger, 2011; Toles et al., 2021).

See Appendix B for a summary of the included articles.

## **Interventions**

From the combined searches, there was limited literature on the design and

implementation of interventions that aid this transition. We found six categories of interventions for subacute-to-home transitions: (a) the use of nurses for home visits and coaching following the transition, (b) geriatric assessments and regular follow-ups by a geriatric team, (c) palliative care consultation services, (d) novel transitional care programs, (e) a novel transitional care program for older dialysis patients, and (f) a novel medicine adherence program for patients discharged home.

### ***Interventions Involving Follow-Ups by Nurses Only***

Two interventions involved nurses. One intervention incorporated nurse practitioners to provide transitional care services for high-risk patients within 72 hours of discharge from a skilled nursing facility (Rose et al., 2021). The elements of the transitional care services provided were medication reconciliation, physical exams, home assessments for fall hazards, community referrals, and communication with primary care providers (Rose et al., 2021). A second identified intervention (named QUEST) was an individualized interaction with an advanced practice nurse that integrated best practices from evidence-based transition models, such as the Transitional Care Model and Project RED (Re-Engineered Discharge; Lenaghan, 2019). In this interaction, an advanced practice nurse coached a population of older adults to follow QUEST by asking Questions, Understanding their treatment, becoming Educated about their illness and medications, knowing which Symptoms to report, and ensuring Timely post-hospital follow-ups (Lenaghan, 2019).

### ***Interventions Involving Geriatric Assessments and Follow-Ups by a Geriatric Team***

Two interventions consisted of geriatric assessments and follow-ups after the transition home by a geriatric team. The geriatric assessments were multidisciplinary and

designed to evaluate an older person's functional abilities, health, cognition, and socioenvironmental circumstances (Nikolaus et al., 1999). One study assigned patients to one of three interventions: (a) comprehensive geriatric assessment and in-hospital and post-discharge follow-up treatment by an interprofessional home intervention team (three nurses, a physiotherapist, an occupational therapist, a social worker, and a secretary), (b) comprehensive geriatric assessment followed by usual care at home, or (c) assessment of activities of daily living and cognition followed by usual care in hospital and at home (Nikolaus et al., 1999). The second intervention was a model of care that involved regular geriatric follow-ups through home visits from a geriatric team (a geriatrician, a nurse, and a physical therapist) that was allocated to randomly selected patients who were discharged from a geriatric ward (Hansen et al., 1995). Patients were visited at one, three, eight, and 16 weeks after hospital discharge. During these visits, geriatric evaluation was performed, and adjustment of medical treatments was carried out as necessary (Hansen et al., 1995).

### ***Interventions Involving Palliative Care Consultation Services***

Two intervention articles involved the use of palliative care consultation services, whereby they examined discharge destination following the consultation service. One study compared the outcomes of early palliative care consultation versus late consultation on percentage of inpatient hospice admissions and length of hospitalization (Reyes-Ortiz et al., 2015). Early palliative care consultation was categorized as care received within three days or less after admission, and late palliative care consultation was received after three days (Reyes-Ortiz et al., 2015). The consultations included discussions about goals of care and the patient's treatment plan (Reyes-Ortiz et al., 2015). Secondly, there was an intervention that administered inpatient acute palliative care

services across an urban-suburban three-hospital system (Santa-Emma et al., 2002). These services consisted of palliative care consultations that centred around clarifying goals of treatment, identification of plans for continuity of care, and focusing on end-of-life issues with patients and their families (Santa-Emma et al., 2002).

### ***Interventions Involving Novel Transitional Care Programs***

There were three novel transitional care intervention programs: the Sub-Acute care for Frail Elderly (SAFE) Unit, Connect-Home, and a Restorative Care program (Robert et al., 2021; Runacres et al., 2016; Toles et al., 2021). The Sub-Acute care for Frail Elderly Unit is a transitional care program that offered function-focused care and was designed to target the persisting capacity issues within hospitals in Ontario, Canada (Robert et al., 2021). The unit had a 450-bed nursing home where discharged patients accessed medical and restorative care provided by an interprofessional team of nurses, internists, geriatricians, physiotherapists, and social workers before returning to their homes (Robert et al., 2021). This intervention provided early discharge planning and cognitive screening upon arrival to further enhance patients' transition back to the community by addressing cognitive impairments (Robert et al., 2021).

The Connect-Home program was a two-step team-based process in which (a) skilled nursing facility staff created an individualized Transition Plan of Care to help the patient manage their illness at home, and (b) a Connect-Home Activation registered nurse then visited the patient at home to implement a written Transition Plan of Care and prepared patients and caregivers to manage serious illnesses at home (Toles et al., 2021).

Finally, the Restorative Care program targeted frail or older acute patients. A rehabilitation charge nurse identified those who would qualify for restorative care, and a

discharge planner subsequently met with the caregivers to identify barriers to discharge (Runacres et al., 2016). At-home services for additional support were also provided (Runacres et al., 2016).

### ***Novel Transitional Care Program for Older Dialysis Patients***

One intervention focused on the transitions of older dialysis patients. Li et al (2007) reported the provision of in-patient rehabilitation with on-site dialysis; a simplified referral system; preferential admission of older dialysis patients; short daily dialysis sessions; integrated multidisciplinary care by experts in rehabilitation, geriatric medicine, and nephrology; and reciprocal continued medical education among staff (Li et al., 2007).

### ***Novel Medication Adherence Program for Patients Discharged Home***

One intervention used one-hour presentations to encourage pharmacists to simplify medication regimens before patients were discharged home (Elliott, 2012). The goal was to reduce the complexity of medication regimens for patients being discharged home to facilitate better adherence to medication (Elliott, 2012).

### ***Interventions with an Equity Lens***

When considering equity stratifiers included in intervention articles, all 11 intervention studies reported age and sex of their participants, four studies reported race or ethnicity of participants (Lenaghan, 2019; Reyes-Ortiz et al., 2015; Santa-Emma et al., 2002; Toles et al., 2021), one study reported religion of participants (Reyes-Ortiz et al., 2015), and one study reported language spoken by participants (Li et al., 2007). However, most studies summarized the characteristics of their participants in a demographics table, while two studies reported early versus late palliative care consults (Reyes-Ortiz et al., 2015) and discharge location (Runacres et al., 2016) by demographic

group, but had no further interpretation of the findings.

### **Structure**

One article included structures, which included characteristics of skilled nursing facilities from which patients were discharged (e.g., facility bed count and facility ownership status: unknown, for-profit, government, or non-profit; Hall et al., 2015).

### **Process or Leading Indicators**

Process or leading indicators were measured prior to transitioning home from a subacute facility. Appendix C provides a summary of the overall frequency of process or leading indicators measured in the included articles.

### **Outcome or Lagging Indicators**

Outcomes or lagging indicators were measured after patients transitioned home from a subacute facility. Appendix D provides a summary of the overall frequency of outcome or lagging indicators measured in the included articles.

### **Discussion**

This literature review provides a description of the populations included in studies addressing the transition from subacute facilities to home. Interventions for subacute-to-home transitions, and the outcomes measured in association with subacute-to-home transitions, were also summarized.

Very few of these articles addressed transitions home for end-of-life populations, despite most articles being focused on older adults. A systematic review and meta-analysis looking at transitions from acute care to home for older adults concluded that there are very few interventions focused on the older



population; however, older adults are at greater risk for hospital readmission following transitions home (Lee et al., 2022). Furthermore, only two articles discussed the caregiver and family perspective during these transitions (Aso et al., 2022; Menzies & Hanger, 2011). Another systematic review also found that perspectives from caregivers are under-reported in intervention studies and recommended that caregiver perspectives be included in future research (Davis et al., 2016). Caregivers and family members often take on most of the responsibility for organizing the transition home and can suffer from caregiver distress (Menzies & Hanger, 2011).

Interventions included in this literature review included equity stratifiers such as age, sex, religion, and language. However, for health care inequities to be addressed, studies must (a) identify inequities, (b) understand how access to health care or health outcomes differs between socio-demographic groups, and (c) understand the “root causes” of the inequity (Health Quality Ontario, n.d.; Isenberg et al., 2022). While the 11 intervention articles reported equity stratifiers, the interventions were not targeted toward marginalized groups to improve their transition experience. Harold Freeman’s patient navigation model and previous research has suggested that patients in minority groups have a higher risk of experiencing negative outcomes such as more hospital readmissions or acute care use after discharge (Freeman & Rodriguez, 2011; Squires et al., 2022; Webber et al., 2020). Therefore, future subacute-to-home transition interventions should address the unique needs of patients from marginalized groups, similar to how some existing interventions have addressed specific disease populations (e.g., Li et al., 2007; Robert et al., 2021). This understanding can help to target inequitable access to palliative care and health outcomes stemming from systemic issues (Isenberg et al., 2022).

Consistent with previous systematic reviews of the literature on transitions from

acute care to home, the interventions in our review of subacute-to-home transitions were implemented throughout the discharge process from subacute care (Saunders et al., 2019) and included planning for discharge and developing a care plan (Albert, 2016; Davis et al., 2016; Lee et al., 2022; Morkisch et al., 2020); preparing for discharge by organizing logistics and community services (Killackey et al., 2020; Scott et al., 2020); care team communication and collaboration (Albert, 2016; Davis et al., 2016; Killackey et al., 2020; Morkisch et al., 2020); follow-up (Albert, 2016; Lee et al., 2022); and medication management, symptom management, and patient education (Albert, 2016; Morkisch et al., 2020). There were some limitations with the included studies such as inconsistent definitions of intervention goals, missing data for the location of follow-up visits with a family physician, and missing data due to the COVID-19 pandemic (Lenaghan, 2019; Robert et al., 2021; Toles et al., 2021).

Similarly, consistent with previous systematic reviews (e.g., meta-analyses, narrative systematic reviews, reviews of randomized controlled trials), outcomes included readmission and rehospitalization (Lee et al., 2022; Morkisch et al., 2020; Piraino et al., 2012; Scott et al., 2020), mortality (Lee et al., 2022; Morkisch et al., 2020), quality of life (Lee et al., 2022; Morkisch et al., 2020), cognitive assessment (Piraino et al., 2012), depression (Piraino et al., 2012), and discharge location (Scott et al., 2020). The interventions seemed to benefit patients—for example, in reducing risk of hospital readmissions and length of stays (Hansen et al., 1995), as well as improving functional status (Santa-Emma et al., 2002). However, it is important to note that these interventions did not promote access to health care services for marginalized groups, which means there is a gap in understanding how interventions could impact these outcomes for these groups (Freeman & Rodriguez, 2011). A suggested next step would be to conduct randomized control studies to systematically

assess if there are specific components of interventions that improve the subacute-to-home transition, especially for marginalized groups who are at greater risk for adverse outcomes.

### **Strengths and Limitations**

The strength of this literature review is that it is the first review beyond the review by Davis et al. (2016) to summarize the literature on subacute-to-home transitions. Further, it is the first review to consider elements of equity alongside a review of interventions that aim to improve subacute-to-home transitions.

There are several limitations. We searched only a limited number of databases, so it is possible that relevant studies published in databases outside of our search may have been missed. With the limitation to English articles, any relevant articles in other languages were not included, which may affect the generalizability of the results. Further, we did not conduct quality and bias assessments of the articles. Additionally, the heterogeneity of study designs, interventions, and outcomes limited our ability to compare across studies.

### **Next Steps**

The next stage of our project is to use findings from this literature review and focus groups to inform our co-design process for an intervention aimed at improving the subacute-to-home transition for people receiving a palliative approach to care. The synthesis of the populations, interventions, and indicators/outcomes included in the articles will be discussed in focus groups to gather suggestions on population selection, interventions, and indicators/outcomes to be included in a co-design process.

We will be implementing recruitment strategies in an effort to include a diverse representation of patients and caregivers in our focus groups and co-design process. We will be

connecting with organizations that provide services and resources to various communities in the Ottawa (Ontario, Canada) region to learn how to best engage a diverse group of participants in our work. We hope to learn how future subacute-to-home transition interventions could address the unique needs of patients from marginalized groups.

### **Conclusion**

Our study provides an initial review of the existing literature on subacute-to-home transitions and may be helpful to practitioners and administrators working to improve these transitions at their institutions. While there was some literature supporting targeted interventions for subacute-to-home transitions for those receiving palliative care or end-of-life care, there were noted limitations to these studies. Furthermore, the included intervention articles did not target marginalized groups.

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## Appendix A

### Search Terms

#### ***Search 1 (MEDLINE via Ovid)***

Terminal Care/Palliative Care/Palliative Medicine/Terminally Ill/palliative\*/end of life\*/(terminal\* or end-stage\* or end stage\* or incurable or advanced) adj3 (disease\* or ill\* or care or cancer\* or malignan\*)/(terminal stage\* or dying or (close adj2 death)

complex\* continuing/rehabilitation care/Subacute Care/(Sub-acute\* or Post-acute\*)

Home Care Services/Home Nursing/Hospice Care/hospice\* care/"Hospice and Palliative Care Nursing"/home\*

AND/OR

patient transfer/ or transitional care/transition\*/transfer\*/patient discharge/(patient\* adj3 discharg\*)/hospital to home transition/(hospital\* adj3 home\* adj3 transition\*)

#### ***Search 2 (MEDLINE via Ovid)***

Terminal Care/Palliative Care/Palliative Medicine/Terminally Ill/palliative\*/end of life\*/(terminal\* or end-stage\* or end stage\* or incurable or advanced) adj3 (disease\* or ill\* or care or cancer\* or malignan\*)/(terminal stage\* or dying or (close adj2 death), or frail\*)

complex\* continuing/rehabilitation care/Subacute Care/(Sub-acute\* or Post-acute\*)

Home Care Services/Home Nursing/Hospice Care/hospice\* care/"Hospice and Palliative Care Nursing"/home\*

palliative care unit\*, "tertiary academic referral cent\*", "tertiary referral cent\*", "Inpatient intermediate care unit\*", Inpatient intermediate care, transition\*

AND/OR

patient transfer/ or transitional care/transition\*/transfer\*/patient discharge/(patient\* adj3 discharg\*)/hospital to home transition/(hospital\* adj3 home\* adj3 transition\*)

#### ***Search 3 (MEDLINE, Embase, HealthSTAR, and the Cochrane Library database via Ovid)***

Terminal Care/Palliative Care/Palliative Medicine/Terminally Ill/palliative\*/(terminal\* or end-stage\* or end stage\* or incurable or advanced) adj3 (disease\* or ill\* or care or cancer\* or malignan\*)/(terminal stage\* or dying or (close adj2 death), or frail\*)

complex\* continuing/rehabilitation care/Subacute Care/(Sub-acute\* or Post-acute\*)

Home Care Services/Home Nursing/Hospice Care/hospice\* care/"Hospice and Palliative Care Nursing"/home\*

palliative care unit\*, "tertiary academic referral cent\*", "tertiary referral cent\*", "Inpatient intermediate care unit\*", Inpatient intermediate care, transition\*

AND/OR

patient transfer/ or transitional care/transition\*/transfer\*/patient discharge/(patient\* adj3 discharg\*)/hospital to home transition/(hospital\* adj3 home\* adj3 transition\*)



## Appendix B

### Overview of Included Articles

Author(s)	Year	Country	Study design	Intervention (if applicable)	Indicators and/or Outcomes
Aso et al.	2022	Japan	Secondary analysis of data from a nationwide post-bereavement survey	n/a	<ul style="list-style-type: none"> <li>• Good death inventory-short version</li> <li>• Family member's perception of the experiences of temporary discharge</li> <li>• Circumstances of the patient and family caregivers before and after temporary discharge</li> </ul>
Elliott	2012	Australia	Observational study of patients discharged from two acute care wards and two subacute aged care wards	Pharmacists attended an hour-long education session on medication regime complexity and medication adherence after discharge home	<ul style="list-style-type: none"> <li>• Discharge location</li> <li>• Length of stay in hospital</li> <li>• Number of medications on admission</li> <li>• Number of medications at discharge</li> <li>• Reasons pharmacists did not make changes to medication regimen complexity before discharge</li> </ul>
Hall et al.	2015	USA	Retrospective cohort study older adults with end-stage renal disease, discharged from a skilled nursing facility	n/a	<ul style="list-style-type: none"> <li>• Facility bed count, ownership status</li> <li>• Registered nurse/licensed practical nurse hours per resident day</li> <li>• Hospitalizations</li> <li>• Emergency department visits</li> <li>• Time to first acute care use after discharge</li> <li>• Deaths after discharge</li> </ul>
Hansen et al.	1995	Denmark	Randomized controlled trial	Regular geriatric follow-up by home visits to selected patients discharged from a geriatric ward	<ul style="list-style-type: none"> <li>• Type of care programs received by patients (e.g., home care, nurse visits, meal delivery)</li> <li>• Medical conditions</li> <li>• Falls</li> <li>• Readmissions</li> </ul>
Lenaghan	2019	USA	Single group pre- and post-intervention survey, pilot	Individualized interaction with an advanced practice nurse that integrated	<ul style="list-style-type: none"> <li>• Patients' level of empowerment (Senior Empowerment and Advocacy in Patient Safety)</li> </ul>

			study	best practices from evidence-based transition models, such as the Transitional Care Model (TCM) and Project RED (Re-Engineered Discharge)	(SEAPS) survey)
Li et al.	2007	Canada	Clinical and demographic data were collected prospectively on patients admitted to an inpatient geriatric hemodialysis rehabilitation program	Provision of in-patient rehabilitation with on-site dialysis, simplified referral system, short daily dialysis sessions, integrated multidisciplinary team of experts (rehabilitation, geriatric medicine, and nephrology), and reciprocal continued medical education among staff	<ul style="list-style-type: none"> <li>• Did patients meet their rehabilitation goals (admission to discharge)</li> <li>• Place of discharge</li> <li>• Functional Independence Measure (FIM) score (admission to discharge)</li> </ul>
Makam et al.	2019	USA	Retrospective cohort study using national Medicare data	n/a	<ul style="list-style-type: none"> <li>• Time spent in an inpatient facility after long-term care admission</li> <li>• Receipt of an artificial life-prolonging procedure</li> <li>• Receipt of a palliative care physician consultation</li> <li>• All-cause mortality</li> <li>• Recovery</li> </ul>
Masel et al.	2015	Austria	Prospective observational study to look at predictors of the feasibility of home discharge	n/a	<ul style="list-style-type: none"> <li>• Estimation made by a nurse and a physician as to whether a patient would be discharged</li> <li>• Discharged from PCU</li> <li>• Mortality</li> <li>• Length of hospital stay before discharge/death</li> </ul>
Masel et al.	2014	Austria	Prospective observational study to determine whether the measurement of heart rate	n/a	<ul style="list-style-type: none"> <li>• Time before discharge</li> <li>• Heart rate variability (HRV)</li> <li>• Karnofsky performance status scale (KPS)</li> <li>• Palliative performance scale (PPS)</li> </ul>

			variability (HRV) was correlated with the likelihood of discharge from the palliative care unit		<ul style="list-style-type: none"> <li>• Time before death</li> </ul>
Menzies & Hanger	2011	New Zealand	Survey completed by facilitated discharge team, Retrospective data analysis of patients' notes for reasons for referral to facilitated discharge program	n/a	<ul style="list-style-type: none"> <li>• Reasons for referral to facilitated discharge program</li> <li>• Services provided to patients in the community</li> <li>• Support received (e.g., family education, management of carer stress, review of medication management, medication compliance, service coordination)</li> <li>• Readmissions 90 days post discharge</li> <li>• Death</li> <li>• Changed from home to residential care 90 days post discharge</li> </ul>
Middleton et al.	2018	USA	Secondary data analysis of facility-level and geographic variation in rates of successful community discharges after inpatient rehabilitation	n/a	<ul style="list-style-type: none"> <li>• Successful community discharge (Community Discharge IRF-QRP measure)—discharge from the inpatient rehabilitation facility to the community (i.e., home or self-care) and remain there without experiencing an unplanned rehospitalization or dying within the next 31 days</li> </ul>
Murmann et al.	2023	Canada	A cost-effectiveness study of the Sub-Acute care for Frail Elderly (SAFE) Unit	n/a	<ul style="list-style-type: none"> <li>• Institution-free days (180 days post-discharge)</li> <li>• Cost incurred for a patient in the SAFE unit (cost from admission to discharge)</li> </ul>
Nikolaus et al.	1999	Germany	Randomized controlled trial	Patients were randomly assigned to one of three interventions: "(i) comprehensive geriatric assessment	<ul style="list-style-type: none"> <li>• Functional status</li> <li>• Self-perceived health</li> <li>• Life satisfaction</li> <li>• Mortality</li> <li>• Hospital readmissions</li> <li>• Length of hospital stay</li> </ul>

				and additional in-hospital and post-discharge follow-up treatment by an interdisciplinary home intervention team, (ii) comprehensive geriatric assessment with recommendations, followed by usual care at home or (iii) assessment of activities of daily living and cognition, followed by usual care in hospital and at home.”	<ul style="list-style-type: none"> <li>• Visits to primary care physicians</li> <li>• Use of community services</li> <li>• Discharge location</li> </ul>
Ohta et al.	2021	Japan	Retrospective cohort study of patients discharged from a rehabilitation facility	n/a	<ul style="list-style-type: none"> <li>• Change in cognitive and motor components of a functional independence measure (at admission and discharge)</li> <li>• Discharge location</li> </ul>
Reyes-Ortiz et al.	2015	USA	Secondary data analysis of palliative care consultation data	Compared the outcomes of early palliative care consultation versus late consultation on percentage of hospice admissions and length of hospitalization	<ul style="list-style-type: none"> <li>• Early or late PC consultation</li> <li>• Length of stay in hospital</li> <li>• Discharge location</li> <li>• Death</li> </ul>
Robert et al.	2021	Canada	Case-Control Study of the Sub-Acute care for Frail Elderly (SAFE) Unit	Examined the effectiveness of a transitional care program that offers early discharge planning and provides patients with a cognitive screening upon arrival to further enhance their transition back to the community by addressing cognitive impairments	<ul style="list-style-type: none"> <li>• Length of stay</li> <li>• Emergency department visits</li> <li>• Hospital readmission</li> <li>• Follow-up with a family physician</li> <li>• Location of follow-up family physician visit(s)</li> <li>• Discharge location</li> </ul>
Rodham et	2012	England	Qualitative	n/a	<ul style="list-style-type: none"> <li>• Patients reported what</li> </ul>

al.			methods to explore how participants coped with the transition from hospital to home (included interviews, participant diaries, and photos used to document the transition home)		had facilitated or hindered them after their transition home
Rose et al.	2021	USA	Survey to measure satisfaction with a transitional care program	Transitional care services were provided to participants including medication reconciliation, physical exams, home assessments for fall hazards, community referrals, and communication with primary care providers	<ul style="list-style-type: none"> <li>• Hospital readmission</li> <li>• Follow up with a health care provider</li> <li>• Patients' satisfaction with their transition to home</li> </ul>
Runacres et al.	2016	Australia	Retrospective clinical audit of consecutive patients admitted to restorative care program	The restorative care program targeted frail or older acute patients. A discharge planner met with the caregivers to identify barriers to discharge and at-home services for additional support.	<ul style="list-style-type: none"> <li>• Duration of admission</li> <li>• Discharge destination</li> <li>• Death</li> <li>• Functional capacity (admission and discharge)</li> </ul>
Santa-Emma et al.	2002	USA	Data was collected and analyzed from implementation of an inpatient acute palliative care services program	Implementation of inpatient acute palliative care services across three hospitals including palliative consults centred around clarifying goals of treatment, plans for continuity of care, and focusing on end-of-life issues with patients and their families	<ul style="list-style-type: none"> <li>• Types of admissions and consultations</li> <li>• Mortality</li> <li>• Discharge location</li> </ul>

Shinall et al.	2019	USA	Retrospective cohort using a prospectively collected database of patients from a tertiary academic referral centre	n/a	<ul style="list-style-type: none"> <li>Reason for palliative care consultation</li> <li>Enrollment in hospice at discharge from the PCU</li> </ul>
Sinn et al.	2016	Canada	Secondary data analysis of data from complex continuing care patients in Ontario assessed with the Resident Assessment Instrument–Minimum Data Set 2.0	n/a	<ul style="list-style-type: none"> <li>Death within 6 months</li> <li>Readmission within 6 months</li> <li>Incidence of or failure to improve possible depression</li> </ul>
Toles et al.	2021	USA	Test the efficacy of Connect-Home, a successfully piloted transitional care intervention	Connect-Home is a two-step process: “(a) skilled nursing facility staff create an individualized Transition Plan of Care to manage the patient’s illness at home; and (b) a Connect-Home Activation RN visits the patient’s home to implement the written Transition Plan of Care.”	<ul style="list-style-type: none"> <li>Preparedness for Discharge</li> <li>Preparedness for caregiving</li> <li>Quality of life</li> <li>Patient function</li> <li>Days of acute care use</li> <li>Caregiver burden and distress at 30 and 60 days after discharge</li> </ul>
Trillig et al.	2022	Switzerland	Case study of one patient with refractory dyspnea after COVID-19	n/a	<ul style="list-style-type: none"> <li>Advance care planning</li> <li>Medication reviews</li> <li>Discharge location</li> </ul>
Tunnard et al.	2021	England	Parallel observational study design incorporating a discrete choice experiment (DCE)— preferences for hypothetical scenarios—	n/a	<ul style="list-style-type: none"> <li>Prioritization of attributes: Timing of communication, Topics to discuss, Timing and mode of communication with family, Communication with GP, and Distance to community hospital</li> </ul>

			with cognitive interviews, and stakeholder consultations		
Walker et al.	2015	Australia	Qualitative in-depth interviews to examine how older people cope with frailty	n/a	<ul style="list-style-type: none"> <li>• Experience in Transition Care Program</li> <li>• Experience after transitioning home</li> </ul>
Webber et al.	2020	Canada	Observational, retrospective cohort study examining data from “patients discharged to the community from the inpatient palliative care unit at Bruyère Continuing Care in Ottawa, Ontario, Canada”	n/a	<ul style="list-style-type: none"> <li>• Length of stay</li> <li>• Supports in the home</li> <li>• Mortality</li> <li>• Readmissions and emergency department visits within 30 days of discharge</li> <li>• Discharge location</li> <li>• Location of death</li> </ul>
Zengin & Taşçi	2021	Turkey	Cross-sectional analysis of medical records from patients admitted to a palliative care unit	n/a	<ul style="list-style-type: none"> <li>• Length of stay in PCU</li> <li>• Location of discharge</li> </ul>
Zhang et al.	2017	USA	Retrospective review of oncology patients’ medical records from the intensive palliative care unit	n/a	<ul style="list-style-type: none"> <li>• Goals-of-care conversation</li> <li>• Do-not-resuscitate/do-not-intubate status</li> <li>• Survival</li> <li>• Hospital readmissions</li> <li>• Time to readmission</li> </ul>

### Appendix C

#### Frequency of Process or Leading Indicators in Included Articles

Indicator	Frequency	Author(s)
Palliative care consultation	4	(Makam et al., 2019) (Reyes-Ortiz et al., 2015) (Santa-Emma et al., 2002) (Shinall et al., 2019)
Length of stay in inpatient facility	3	(Makam et al., 2019) (Robert et al., 2021) (Santa-Emma et al., 2002)
Length of stay in a palliative care unit	3	(Runacres et al., 2016) (Webber et al., 2020) (Zengin & Taşçi, 2021)
Type of care programs and supports received by patients when they were discharged home	3	(Hansen et al., 1995) (Menzies & Hanger, 2011) (Webber et al., 2020)
Length of stay in hospital	3	(Elliott, 2012) (Masel et al., 2015) (Reyes-Ortiz et al., 2015)
Advanced care planning conversations	1	(Trillig et al., 2022)
Do-not-resuscitate/do-not-intubate status reviews	1	(Zhang et al., 2017)
Goals-of-care conversations	1	(Zhang et al., 2017)
Life-prolonging procedures	1	(Makam et al., 2019)
Medication reviews	1	(Trillig et al., 2022)
Number of medications on admission and at discharge	1	(Elliott, 2012)
Reasons medication regimen was not changed prior to discharge	1	(Elliott, 2012)
Nurse or physician estimation of whether a patient would be discharged	1	(Masel et al., 2015)
Patients' preparedness for discharge/family members' preparedness for caregiving	1	(Toles et al., 2021)
Patients' prioritization of conversations	1	(Tunnard et al., 2021)
Time before discharge	1	(Masel et al., 2014)



## Appendix D

### Frequency of Outcome or Lagging Indicators in Included Articles

Indicator	Frequency	Author(s)
Discharge location	14	(Elliott, 2012) (Li et al., 2007) (Masel et al., 2015) (Menzies & Hanger, 2011) (Nikolaus et al., 1999) (Ohta et al., 2021) (Reyes-Ortiz et al., 2015) (Robert et al., 2021) (Runacres et al., 2016) (Santa-Emma et al., 2002) (Shinall et al., 2019) (Trillig et al., 2022) (Webber et al., 2020) (Zengin & Taşçi, 2021)
Mortality/death rate	10	(Hall et al., 2015) (Makam et al., 2019) (Masel et al., 2015) (Menzies & Hanger, 2011) (Nikolaus et al., 1999) (Reyes-Ortiz et al., 2015) (Runacres et al., 2016) (Santa-Emma et al., 2002) (Sinn et al., 2016) (Webber et al., 2020)
Hospital/acute care readmission	8	(Hall et al., 2015) (Hansen et al., 1995) (Nikolaus et al., 1999) (Robert et al., 2021) (Rose et al., 2021) (Sinn et al., 2016) (Webber et al., 2020) (Zhang et al., 2017)
Cognitive and motor function	5	(Li et al., 2007) (Nikolaus et al., 1999) (Ohta et al., 2021) (Runacres et al., 2016) (Toles et al., 2021)
Emergency department visits after discharge	3	(Hall et al., 2015) (Robert et al., 2021) (Webber et al., 2020)
Patient satisfaction and experience transitioning home	3	(Rodham et al., 2012) (Rose et al., 2021) (Walker et al., 2015)

Visits to primary care physicians and community services after discharge	3	(Nikolaus et al., 1999) (Robert et al., 2021) (Rose et al., 2021)
Caregiver experience with transition home and stress	2	(Aso et al., 2022) (Toles et al., 2021)
Length of readmission stay	2	(Nikolaus et al., 1999) (Toles et al., 2021)
Cost incurred for a patient in the SAFE <sup>1</sup> Unit (cost from admission to discharge)	1	(Murmann et al., 2023)
Empowerment	1	(Lenaghan, 2019)
Falls	1	(Hansen et al., 1995)
Heart rate variability	1	(Masel et al., 2014)
Incidence of depression	1	(Sinn et al., 2016)
Institution-free days (within 180 days post-discharge)	1	(Murmann et al., 2023)
Karnofsky Performance Status Scale	1	(Masel et al., 2014)
Life satisfaction	1	(Nikolaus et al., 1999)
Location of death	1	(Webber et al., 2020)
Medical conditions	1	(Hansen et al., 1995)
Number of days until death before discharge from hospital	1	(Masel et al., 2014)
PPS status	1	(Masel et al., 2014)
Quality of life	1	(Toles et al., 2021)
Recovery rate (60 days without inpatient care after Long-Term Acute Care admission, such as hospitalization)	1	(Makam et al., 2019)
Rehabilitation	1	(Li et al., 2007)
Self-perceived health	1	(Nikolaus et al., 1999)
Successful discharge (remaining in the community for 31 days after discharge without unplanned re-hospitalization or death)	1	(Middleton et al., 2018)
Survival rate (time from palliative care unit admission to death)	1	(Zhang et al., 2017)
Time to readmission	1	(Zhang et al., 2017)
Whether good death was achieved (measured using the Good Death Inventory survey)	1	(Aso et al., 2022)