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Assuring a Continuum of Care for Heart Failure Patients Through Post-Acute Care Collaboration: An Integrative Review

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Brief Biography (50 words): Purnima Krishna, MSN, MBA, RN, NEA-BC, is the Director of Quality for a Cardiovascular Service Line in Palo Alto, California. She is in the Executive Leadership DNP program at the University of San Francisco and has 21 years of healthcare quality, risk management, and critical care experience.

Abstract

Purpose/Objectives: This review evaluates the published studies on how post-acute care collaboration ensures a continuum of care and reduces heart failure (HF) readmissions.

Primary Practice Setting: An integrated literature review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 Statement. PubMed and Cumulative Index to Nursing and Allied Health were searched for the keywords *heart failure AND (post-acute care OR transitional care OR skilled nursing facility OR rehabilitation facility OR home health* agency) *AND (readmission) AND (care coordination OR collaboration OR interprofessional OR partnerships).* Seventy-nine studies were returned, and a reverse reference search yielded four studies. Of those studies, 14 were selected for critical appraisal of evidence. The practice settings of these studies were hospitals, homes, home health agencies, and skilled-nursing facilities.

Findings/ Conclusion: Multidisciplinary management of HF patients, high-impact transitional care interventions, and integration with post-acute care facilities decreased HF 30-day readmissions. Collaborative models involving a skilled HF team, primary care physicians, and post-acute care partners, and targeting post-discharge follow-ups positively impacted outcomes. Bundling interventions, such as home visits, follow-ups (telephone and/or clinic follow-up), and telecare significantly impacted outcomes compared to their delivery in isolation.

Implications for Case Management Practice: Case Management leaders are vital decision-makers and key stakeholders in building the collaboration with community partners. As case management roles extend to outpatient and ambulatory care, better opportunities emerge to coordinate services across settings. Key takeaways for the case management practice is to build a robust case management program spanning post-acute care facilities, evidence-based treatment protocols, and infrastructure that supports seamless information sharing between sites.

Introduction

The number of U.S. adults living with heart failure (HF) is projected to reach eight million by 2030, a 46% increase from 2012 (Viran i et al., 2021). The cost of HF management, by comparison, is projected to increase by 127%, from $30.7 billion in 2012 to $69.8 billion by 2030 (Benjamin et al., 2019; Virani et al., 2021). A key cost driver for HF management is 30-day hospital readmissions (Van Spall et al., 2018), with one in five HF patients readmitted within 30-days of discharge (Earl et al., 2020; Khera et al., 2020). Reducing the 30-day readmission rate, a high priority for the Centers for Medicare & Medicaid Services (CMS), was the impetus for establishing the Hospital Readmission Reduction Program within the 2010 Affordable Care Act (CMS, 2020). Clinical management of HF patients has also improved by introducing guideline-directed medical therapies that have reduced 30-day readmissions and mortality (American Heart Association, 2018; Maddox et al., 2021).

Interest in transitional care interventions has grown as a strategy to reduce 30-day readmissions and prevent adverse events during transition. Patients who transition from one care setting to another are the most vulnerable to adverse events and medication-related errors (Earl et al., 2020; Forster et al., 2003). Models such as the Transition of Care Model, Care Transitions Interventions, and Project Better Outcomes for Older Adults Through Safe Transitions[®] have decreased the 30-day readmission rate, especially for high-risk and older adult populations (Albert et al., 2015; Earl et al., 2020). The models bundle interventions of medical management, patient and family education, discharge packet, and follow-up after discharge with phone calls and or clinic visits to achieve a continuum of care.

Despite clinical improvements and transition of care interventions, gaps in care coordination, which lead to rehospitalization, still exist for HF patients. The COVID-19

pandemic widened the care coordination gap when stay-at-home orders were implemented, and ambulatory clinic access was limited to exceptional cases (Czeisler et al., 2020). Establishing a continuum of care with high-impact interventions when patients are discharged, whether to home, home health agencies, or skilled nursing facilities, is crucial for improving HF outcomes.

Methods

Aim

This integrative review aims to identify, critically analyze, and synthesize the evidence on how post-acute care collaboration reduces heart failure readmissions. The PICOT question that guided the literature search was: In heart failure patients, how does post-acute care collaboration for transitions of care compared to no collaboration affect the 30-day readmission rate?

Literature Search

The literature search was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 Statement (Page et al., 2021). A search of the PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases was performed with keywords and Boolean operator combinations *(heart failure) AND (post-acute care OR transitional care OR skilled nursing facility OR rehabilitation facility OR home health* agency) *AND (readmission) AND (care coordination OR collaboration OR interprofessional OR partnerships).* The search was limited to studies published in English between 2016 and 2022. Seventy-nine articles were returned, 34 from CINAHL and 45 from PubMed, of which seven were duplicates. A reverse search of references yielded four additional articles of potential interest.

The titles and abstracts of 76 studies were reviewed for relevance to transition of care from hospital to post-acute care facilities. The 20 selected for full-text review addressed the continuum of care, had some degree of multidisciplinary collaboration, electronic health record operability, and interventions applicable to HF patients after discharge. Studies were subsequently excluded if they had interventions by a single discipline, did not involve hospitals, or were case studies or non-peer-reviewed periodicals. Fourteen studies were selected for critical appraisal of evidence (see Figure 1). See Table, Supplemental Digital Content 1, which illustrates the inclusion and exclusion criteria for study selection.

INSERT Figure 1

Data Quality

The Johns Hopkins Evidence-Based Practice Model for Nursing and Healthcare Professionals Appraisal Tools (Dang et al., 2022) were used to critically analyze each study for the level and quality of evidence. Eight research and six non-research studies were appraised. See table, Supplemental Digital Content 2, which summarizes studies in an Evidence Evaluation Table.

Findings

Four themes emerged from the published studies on collaboration between acute and post-acute care that met the inclusion criteria for this review: multidisciplinary collaborative care models, post-discharge follow-ups, the flow of patient information, and integration with post-acute care facilities.

Multidisciplinary Collaborative Care Models

Collaboration among HF specialists, including advanced practice providers, registered nurses, primary care physicians, pharmacists, and case managers, has been shown to reduce the

30-day HF readmission rate (Boykin et al., 2018; Driscoll et al., 2016; Hinch & Staffileno., 2021; Jepma et al., 2021; Naylor et al., 2018; Raat et al., 2021; Radhakrishnan et al., 2018; Summers & Atav, 2020). Driscoll et al. (2016) conducted a systematic review of 29 studies, 10 of which were randomized control trials (RCTs). When primary care physicians (PCPs) shared patient care with a cardiologist, HF readmission rate and mortality rate decreased. A transitional care model developed by Naylor et al. (2018) had two multidisciplinary collaboration components: coordinating care among clinicians and sites and collaborating on the care plan with clinical teams, patients, and caregivers. Boykin et al. (2018) conducted a quality improvement study investigating collaboration among transition of care (TOC) pharmacists, HF advanced practice providers, and community paramedics. The post-intervention 30-day readmission rate for HF patients receiving collaborative care was 10.5%, compared to 23.5% with usual care. Heart failure readmissions are reduced when providers internal and external to the organization collaborate on improving outcomes.

A meta-analysis by Raat et al. (2021) noted a decrease in HF readmissions with multidisciplinary HF disease management programs and PCP involvement in the transfer of care, as compared to the usual care (relative risk 0.76, 95% CI [0.62-0.93]). By contrast, Jepma et al. (2021) found a nurse-coordinated "cardiac care bridge" transitional care program did not impact the readmission rates of cardiac patients 70 years of age and older. This study suggested that high-intesity interventions may not be appropriate for high-risk older patients and they would benefit mainly from quality-of-life efforts in post-acute care. Additional studies are needed to elucidate age-specific disease management programs.

Post-Discharge Follow-Ups

Follow-ups with a patient after discharge are elemental to a continuum of care. A systematic review and meta-analysis by Vedel and Khanassov (2015) identified "home visits by a home health nurse" and "frequency of monitoring" as two critical transitional care interventions related to follow-up. Combining home visits with follow-ups such as telephone calls, clinic visits, and/or video visits produced "high-intensity" interventions that reduced readmission risk by 8%. Using Coleman's Care Transition Model, Radhakrishnan et al. (2018) established a continuum of care process across hospitals and post-acute facilities by arranging home visits and three follow-up phone calls within 30 days. Although no pre-implementation readmission rate was provided, post-implementation rate of 7.1% is appreciably below the 20% rate cited in the literature (Earl et al., 2020; Khera et al., 2020).

Weerahandi et al. (2020) reviewed the impact of home health care (HHC) after skilled nursing facilities (SNF) discharge home. The readmission rate for patients with HHC after SNF discharge was 22.8%, compared to 24.5% for those discharged home without HHC. The implications of HHC for HF patients were revealed in a descriptive study by Flanagan et al. (2018), which explored the predictors of 30-day readmissions after discharge from SNF. Patients with prior HF diagnosis had a three-times higher chance of readmission within 30 days than other diagnoses.

The Flow of Patient Information

The flow of patient information between internal teams in the hospital and between care settings is critical for effective transition of care (Adler-Milstein et al., 2021; Boykin et al., 2018; Samal et al., 2016). In a national survey of SNF Nursing Directors, Adler-Milstein et al. (2021) studied the quality of information shared by the hospitals when discharging patients to SNFs. For half of the respondents, almost 80% of information was missing; an average of 6 hrs 30 min per

week was spent communicating with the hospital to obtain information. In the Boykin et al. (2018) study, the inpatient HF team used a referral system to initiate post-discharge communication with the external groups and shared information through electronic health records. In a TOC pilot program between a seven-hospital health system and a sizable post-acute care provider, a transitions coach maintained the database of HF patients enrolled in the program and facilitated frequent communications between organizations (Radhakrishnan et al., 2018). Vedel and Khanassov (2015) recommended establishing post-discharge communication and improving the quality of information exchanged between the teams. In these studies, the means of communication between organizations were the electronic health record and/or specific personnel assigned to the task. Further studies on the efficacy of various means of communication and their integration into care transitions models are needed.

Integration with Post-Acute Care Facilities

Both acute care and post-acute care hospitals are accountable for the post-discharge outcomes under the CMS reimbursement models. In the vertical integration model, organizations offer different levels of care, services, or functions either directly or through others. Gupta et al. (2019) examined the association between hospital-based SNFs (HBSNFs) and acute myocardial infarction, HF, and pneumonia readmission rates. Hospitals with HBSNFs had lower readmission rates from better integration of communication workflows and information technology resources. Hospitals that collaborated with certified home health agencies (HHAs) had lower readmission rates than hospitals that did not (Summers & Atav, 2020).

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Discussion

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The review of literature on how post-acute care collaboration can reduce 30-day HF readmissions surfaced several "takeaways" to inform improvements in the transition of care for

HF patients. Specific to readmissions, multidisciplinary management of HF patients, high-impact transitional care interventions, efficient flow of patient information, and integration with post-acute care facilities decreased HF 30-day readmissions. A collaborative model that involved the HF team, PCP, and community partners and targeted post-discharge follow-ups with HF clinic or PCP positively impacted readmission outcomes. For care transitions, bundling follow-up interventions (i.e., home visits, telephone or clinic follow-up, and telecare) improved outcomes over delivery in isolation.

When home health services supported the next level of transition from SNF to home, readmissions decreased, but only 20% of SNF discharges received such services (Weerahandi et al., 2020). When applying evidence in the practice setting using transitional care models, adaptation knowledge is critical to balance strict adherence to the components and the degree of adaptation so the value of the intervention will be maintained. Naylor et al. (2018) found that the organizations adapt transition of care models locally based on motivation and availability of resources.

Strong integration between hospitals and post-acute care settings was shown to reduce readmission and improve patient outcomes. The advantage of vertically integrated health systems is service coordination and strong governance. As the strategies for organizational structure evolve, inter-organizational networks between hospitals, SNFs, and HHAs may achieve the best integration.

Limitations

Collaboration of hospitals with post-acute care facilities is not well studied relative to interventions administered by either hospitals or post-acute care facilities. Unless organizations are part of the bundled payment or accountable care organizations, evidence of how

collaboration is developed and sustained between non-integrated organizations is lacking. By 2022, CMS is developing seven episode-based cost measures through its Merit-based Incentive Payment System (CMSHHSgov, 2022). One measure aims to reduce episode-based costs for HF outpatient treatment and management. Hospitals participating in the Merit-based Incentive Payment System will need to optimize TOC interventions and reduce readmissions to limit the episode cost. The recent expansion of telehealth during COVID-19 may influence the post-discharge follow-up practices for hospitals and PAC facilities. The studies reviewed preceded these emerging strategies to reduce readmissions through a continuum of care.

Implications for Case Management Practice

As case management roles extend to outpatient and ambulatory care, better opportunities emerge to coordinate services across settings (Bober & Ferket, 2021). The value-based payment model provides the impetus for healthcare organizations to pilot collaborative strategies with PAC facilities by creating preferred partnership networks or participating in accountable care organizations (Kennedy et al., 2020). Key takeaways for the case management practice is to build a robust case management program spanning post-acute care facilities, evidence-based treatment protocols, and infrastructure that supports seamless information sharing between sites. Case Managers can ensure efficient flow of patient information by adopting innovative health information technology and ensuring information quality is maintained when referrals are placed for transitions (Hinch & Staffileno., 2021). They are better positioned to identify patients at risk for poor transitions and match their needs to an appropriate discharge setting (Adler-Milstein et al., 2021; Boykin et al., 2018; Samal et al., 2016). Case Management leaders are vital decision-makers and key stakeholders in building the collaboration with community partners. Coordination of care across the continuum improves

patient outcomes and reduces unnecessary readmissions for the patients.

Conclusions

The evidence supports collaboration as a practice change for the transition of care and reduction of 30-day readmissions for HF patients. Establishing a continuum of care with high-impact interventions when patients are discharged to home, home health agencies, and skilled nursing facilities is crucial for improving HF outcomes. Collaboration can bring synergy to independent practices for managing HF patient care but is not easily established in disconnected care systems. The evidence indicates that optimizing care systems at the macro level of hospitals and post-acute care facilities is the best way to ensure a continuum of care and reduce HF readmissions.

List of Supplemental Digital Content

- Supplemental Digital Content 1, Table that illustrates the inclusion and exclusion criteria for study selection.

- Supplemental Digital Content 2, Table summarizes appraised studies in an Evidence Evaluation Table

Figure 1: Literature Search Results
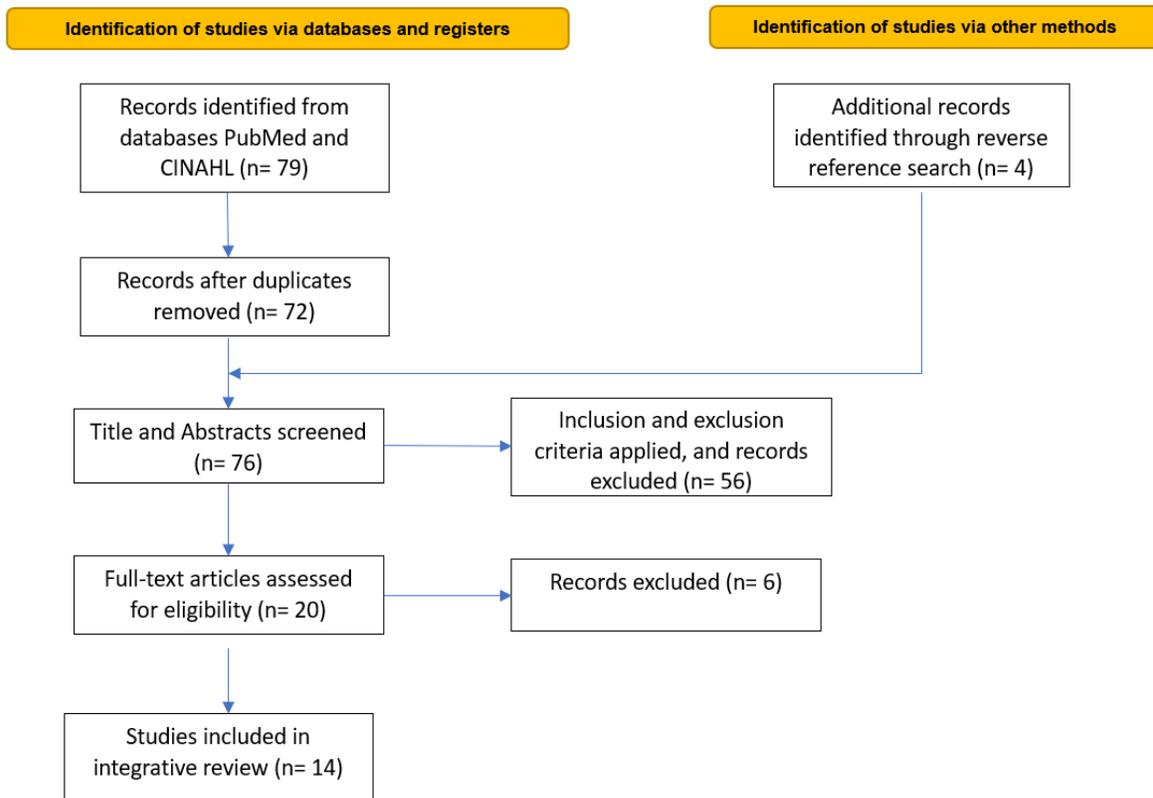
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Supplemental Digital Content 1: Inclusion and Exclusion Criteria for Selecting Studies for Review

Inclusion Criteria	Exclusion Criteria
Keywords: Heart failure AND (post acute care OR transitional care OR skilled nursing facility OR rehabilitation facility OR home health agency) AND (readmission) AND (care coordination OR collaboration OR interprofessional OR partnerships)	Titles without terms
Heart Failure Readmission Reduction	Interventions by single discipline
Transition of Care from hospital to post-acute care facilities	Interventions that did not involve hospital
Multidisciplinary collaboration	No full-text available
HRRP initiatives	Case-study
EHR interoperability	Non-peer reviewed periodicals
English language	
Articles published during 2016- 2022	

HRRP: Hospital Readmission Reduction Program, EHR: Electronic Health Record

Supplemental Digital Content 2: Evidence Evaluation Table

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
Adler-Milstein, J., Raphael, K., O'Malley, T. A., & Cross, D. A. (2021). Information sharing practices between US hospitals and skilled nursing facilities to support care transitions. *JAMA Network Open*, *4*(1), e2033980. https://doi.org/10.1001/jamanetworkopen.2020.33980							
To measure the completeness, timeliness, and usability of information shared by hospitals when discharging patients to SNFs, and to identify relational and structural characteristics associated with better hospital-SNF information sharing.	**Design:** QuaNtiative Structured survey **Methods:** The survey was pilot tested with semi-structured interview questions to Directors of Nursing of sample SNFs. Findings from pilot analysis was used to create 27 structured questions. Surveys were mailed to DONs of selected SNFs. The study was approved by the IRB at the	**Sample:** 500 SNFs Respondent n= 265 SNFs, representing 471 SNF-hospital pairs **Setting:** Across U.S.	**IV 1**: Hospital relationship -Formal integration (ownership/coloca tion) -Informal integration (shared staffing across sites) **IV 2**: Information sharing -23 specific categories of necessary information **IV 3:** Facility and IT characteristics **DV:** Information sharing in the dimension of completeness, timeliness, and usability	For each dimension, a 5-point Likert scale from 1 (poor) to 5 (excellent) was used. The independent variables were assessed using "always/often," "sometimes," or "rarely/never." For relational characteristics, eight binary measures were used. The structural characteristics were examined for SNF (4 measures) and hospitals (5 measures).	Descriptive statistics used at the hospital-SNF pair level, overall performance, and of detailed measures of completeness, timeliness, and usability. conducted bivariate models, followed by multivariate logistic regressions. All results are presented using odds ratios (ORs). Analysis were conducted using SAS	Having a hospital clinician at the SNF was statistically significant for completeness (p = .03), timeliness (p = .02), and usability (p = .04). 49.6% did not meet the limit of at least 80% of information typically received. SNFs reported spending mean (SD) of 6.5 (8.2) hours per week on back-and-forth communication with the hospital to	**LOE: III- A** **Worth to practice:** The collaborative efforts to improve IT infrastructure and clinician spanning both sites are significant factors for information sharing. **Strengths:** It is a unique national survey of SNF DONs that focused on information sharing as the critical element of transition of care. The survey questions were pilot-tested with small sample before finalizing which added validity and reliability of the tool. **Weaknesses:** The study do not assess the relationship between information sharing and outcomes such as

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
	Harvard T.H. Chan School of Public Health. **Framework:** American Association for Public Opinion Research (AAPOR) reporting guideline for survey studies.				software, 9.4 (SAS Institute Inc).	obtain information. When SNF were formally integrated with the hospital, better completeness of information (P = .002). Participation in an accountable care organization noted better timeliness (p = .03).	readmissions or mortality. Since the study uses self-reported data, the responses were subjective. **Feasibility:** The gaps identified in the study are feasible to close with standard practices and broader policy changes. **Conclusion(s):** For an optimal care coordination, the hospital and SNFs need to invest in electronic data sharing and expanded scope of clinicians at both settings. **Recommendation(s):** The findings of the study is important for nursing, medical and IT leadership. Discharge summaries must be updated and providers be accessible to ease the transition process.

Definition of abbreviations: SNF: Skilled nursing facility, DON: Director of Nursing, IRB: Institutional Review Board, OR: Odds Ratio, CI: Confidence Interval

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colspan="8"	Boykin, A., Wright, D., Stevens, L., & Gardner, L. (2018). Interprofessional care collaboration for patients with heart failure. *American Journal of Health-System Pharmacy*, 75(1), e45–e49. https://doi.org/10.2146/ajhp160318
To describe the collaboration between healthcare professionals during transition from hospital to the home setting.	**Design:** Quality improvement project **Method:** Team-based approach-Advance care practitioners, Community paramedics and TOC pharmacists. **Framework:** IHI Triple Aim goal: to improve patient experience, outcomes, and per-capita cost.	**Sample:** 86 patients discharged under HF collaborative care model compared to 596 patients with usual care over a 7-month period. **Setting:** 855 beds community teaching hospital	**IV:** Interdisciplinary interventions 1: TOC pharmacist- Medication education & reconciliation, assessing access and adherence barriers within 1 wk of discharge 2: Community Paramedic program for high-utilizers and high-risk readmission cases. The interventions included home safety inspections, conducting social support needs assessments, and connecting patients with community resources. Lab tests	30-day readmission rate of patients with primary diagnosis of HF	Internal administrative data Shared EMR	The 30-day readmission rate under collaborative care model was 10.5% as compared to 23.5% with usual care during 7-month period.	**LOE: V-B** **Worth to practice:** A team approach to manage chronic conditions such as HF, ensures continuity of care and positively impacts the outcomes of readmission reduction. **Strengths:** - Grant funding for TOC pharmacist position which was converted to full-time position -Outreach by skilled community paramedics - Team-based approach with individual expertise -Real-time information sharing with shared EHR and resolution of issues. **Weaknesse**s: -Paramedic program available to only patients within 30-mile radius. - Being a QI study is it is spedific to the local organization and may not be broadly generalizable

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			3: ACP- Heart Strong program- management of acute symptoms, GDMT, referrals to advance therapies. 4: HF RN- 1:1 education, care coordination and medication adjustment

DV: 30-day readmission rate for HF population | | | | **Feasibility**- Team based transition of care is a feasible model and may be successful in reducing readmissions for aging and high-risk HF patients

Conclusion- The high-utilizers/multi-visit patients are concerns for every organization. The collaboration with teams beyond acute care are promising to reduce rehospitalization.

Recommendation: The partnership with community resources will address some of the SDOH issues. Socio-economic factors are also the reason for multiple readmissions among HF patients. Health Equity is one of the focus this year for the organization. |
| Definition of abbreviations: IV- Independent variable, DV- Dependent variable, IHI- Institute for Healthcare Improvement, HF- Heart Failure, TOC- Transition of Care, EMR- Electronic Medical Records, GDMT- Guideline Directed Medical Therapy, ACP- Advance care practitioners, SDOH- Social Determinants of Health ||||||||

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
Driscoll, A., Meagher, S., Kennedy, R., Hay, M., Banerji, J., Campbell, D., Cox, N., Gascard, D., Hare, D., Page, K., Nadurata, V., Sanders, R., & Patsamanis, H. (2016). What is the impact of systems of care for heart failure on patients diagnosed with heart failure: A systematic review. *BMC Cardiovascular Disorders*, *16*. https://doi.org/10.1186/s12872-016-0371-7							
Aim of the review was to examine systems of care for heart failure that reduce hospital readmissions and/or mortality	**Design:** Systematic review **Method**- Studies included were: English language, RCTs, non-RCTs, observational and cohort studies that reported systems of care for patients diagnosed with HF and aimed at reducing hospital readmissions and/or mortality. -Reviewed articles from January 2008 to August 2015 -Ovid, MEDLINE- (145), EMBASE (107), CINAHL	**Sample**: Search yield (N= 520) articles n=29 met eligibility criteria (see Method for types of study designs) **Setting:** Worldwide	**IV**: Systems of care in the following 1: Specialist workforce, 2: primary care, 3: In-hospital care 4: Transitional/ Community based care 5: Nurse-led medication titration 6: Outpatient clinics 7: Telemonitoring/ telehealth **DV** 1: Readmission rates 2: Mortality rates	Quality of evidence assessed by: Newcastle-Ottawa Scale (NOS) for non-RCTs and GRADE rating tool for RCTs Cochrane Collaboration tool for risk of bias for randomized trials	Three authors selected articles independently based on inclusion and exclusion criteria. Disagreements were resolved by discussion and consensus between the three authors. PRISMA flow diagram	-Strong evidence r/t to implementation of heart failure service in the hospital. Care provided by heart failure service reduces hospital readmissions and mortality - Collaborative model with primary physician and cardiologist also improved patient outcomes compared to a primary physician only. - In-hospital QI programs improved the quality of care resulting in reduced	**LOE: III-B** **Worth to practice**: There are several finding that are helpful in HF management. **Strength**s: -Well-described methodology, quality of evidence and findings. **Weaknesses:** None from the systematic review. Limitations from heterogeneity of the interventions, end outcomes, length of f/u and study design, and unable to perform meta-analysis. **Feasibility**: The evidence could be used for designing pre & post discharge interventions and for developing partnership with PCP, outpatients & post-acute care facilities.

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
	(21), Cochrane Central Register of Controlled Trials (9), grey literature, reviewed bibliographies, clinical trials registries (WHO ICTRP), clinical trials, heart failure guidelines **Framework:** Cochrane Highly Sensitive Search Strategy					hospital readmissions and mortality. - Nurse-led clinics, and early outpatient follow-up reduced hospital readmissions. - Lack of evidence as to the efficacy of telemonitoring with many studies finding conflicting evidence	**Conclusion:** HF is a chronic complex condition that worsens over time and will require effective systems of care. Organizations must implement bundle of interventions to obtain maximum benefit. **Recommendations:** Findings provides list of high-quality evidence to consider for implementation. It also warrants further study on telemonitoring/telehealth and involvement of primary care providers, especially now when the pandemic has shifted the modes of communication between providers and patients.

Definition of abbreviations: QI- Quality Improvement, WHO- World health Organization, ICTRP- International Clinical Trial Registry Platform, PCP- Primary Care Physicians, f/u- follow-up, GWTG- Get with the Guidelines, BOOST- Better Outcomes for Older Adults through safe transitions, STAAR- State Action on Avoidable Rehospitalization, H2H- Hospital-to-Home program

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
Flanagan, N. M., Rizzo, V. M., James, G. D., Spegman, A., & Barnawi, N. A. (2018). Predicting risk factors for 30-day readmissions following discharge from post-acute care. *Professional Case Management*, *23*(3), 139–146. https://doi.org/10.1097/NCM.0000000000000261								
a) To examine the relationship between individual-level determinants of health and those residents readmitted to the hospital within 30 days when discharged from the same SNF b) To identify and describe the risk factors of the residents readmitted within 30 days c) To use the findings to inform and refine current practice to target the mutable risk factors correlated with 30-day hospital readmission.	**Design:** Descriptive Study **Method:** Retrospective chart reviews of patients discharged from SNF to home and follow-up phone call to get 30-day readmission diagnosis. **Framework:** Andersen's Behavioral Model for Health Services Use	**Sample:** N=221 Patients ≥ 65yrs admitted to the SNF from Jan to Dec 2014 following hospitalization. **Setting:** 180-bed SNF in Northeastern Pennsylvania.	**IV:** Individual determinants of health, risk factors, and mutable risk factors. **DV:** 30-day hospital readmission	Data collected by two nurses, principal investigator and research assistant. Used an instrument developed specifically for the study. To measure Need Factors, following tools were used- a) CAM, b) Barthel Index, c) BIMS, d) GDS, e) Braden Scale, f) fall risk instrument developed by SNF. 30-day readmission data were collected by	Independent variables were cross tabulated with 30-day readmission, dichotomized as 30 days before and after readmission, and $\chi 2$ analyses were conducted. To identify independent predictors, variables were entered into logistic regression model using forward Wald procedure. To understand pre-admission predictors, analysis was done after	Odds of readmission within 30 days were three times greater in patients with CHF (p< 0.02); Patients at "very high risk" on the Braden Scale were 20 times more likely to be readmitted before 30 days compared with those at low risk. Patients with diagnosis of COPD or pneumonia (p < 0.003) when arriving at the ED were over 14 times more likely to be readmitted. The following were not the	**LOE: III-B** **Worth to practice**: This is the first study that analyzed 30-day readmissions predictors after SNF discharge. CHF diagnosis again came as the top predictor for readmissions. Chronicity of CHF and COPD impacts mobility and malnutrition which could be addressed with targeted interventions of rehab and dietician. **Strength**s: Well-conducted retrospective study supported by grant from TAE Program at Binghamton University. **Weaknesses:** Sample was unrepresentative. Only one of the participants was non-white. Sample was from only one SNF.

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				follow-up phone call to patient.	removing admission diagnosis at readmission.	predictors of readmissions: marital status, age, and gender. Similarly, none of the other screening assessments were predictive.	Biased data as chart may have inaccurate or missing information. Family self-reported the readmission diagnosis (Type II error) **Feasibility**: Evidence could be used to develop post-discharge best practices for SNF. **Conclusion:** Readmission rate lower than the national average may be due to leadership oversight and coordination of care by nursing and social workers. **Recommendations:** Even though the study setting was SNF, the malnutrition screening and nutrition consult can be initiated in the acute care setting.
Definition of abbreviations: SNF- Skilled Nursing Facility, Hgb-Hemoglobin, HCT- Hematocrit, CAM- Confusion Assessment Method, BIMS- Brief Interview for Mental Status, GDS- Geriatric Depression Scale, CHF- Congestive Heart Failure, COPD- Chronic Obstructive Pulmonary Disease, TAE- Transdisciplinary Areas of Excellence							

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
Gupta, S., Zengul, F. D., Davlyatov, G. K., & Weech-Maldonado, R. (2019). Reduction in hospitals' readmission rates: Role of hospital-based skilled nursing facilities. I*nquiry: The Journal Of Health Care Organization, Provision, And Financing*, 56, 0046958018817994. https://doi.org/10.1177/0046958018817994							
To examine the association between HBSNFs and hospitals' readmission rates	**Design:** Nonexperimental correlational study **Methods:** Data sources included American Hospital Association Annual Survey, Area Health Resources Files, the Centers for Medicare and Medicaid Services (CMS) Medicare cost reports, and CMS Hospital Compare. **Framework:** a) Vertical Integration b) Resource-Based View of the Firm	**Sample:** All nonfederal medical/surgical, acute-care hospitals in U.S. between 2007 and 2012 N= 24,556 AMI: n=8357 CHF: n=13,464 Pneumonia: n= 14,114 **Setting:** Across U.S.	**IV:** Presence of HBSNF in a hospital **DV:** 30-day risk-adjusted readmission rates for AMI, CHF, and pneumonia	30-day risk-adjusted readmission rates for AMI, CHF, and pneumonia for Medicare beneficiaries aged 65 years or more from Hospital Compare website The presence or absence of an HBSNF in a hospital was measured based on number of HBSNF beds reported by the hospital in the AHA survey and Medicare Cost Reports.	Bivariate analysis to assess the differences in the organizational and market characteristics between hospitals with and without HBSNFs. GEE models were used to examine the effect of HBSNFs on the overall variation in hospitals' readmissions. To address potential selection bias propensity score weighting of the GEE models was done.	Between 2006 to 2012, 7% decrease in the proportion of hospitals with a SNF. The system-affiliated hospitals, as compared to the hospitals without affiliation, were associated with lower readmission rates for CHF ($\beta = -1.30$, P < .001). Hospital location had mixed effects on readmission rates. Higher proportion of SNFs to hospitals in the county had a significant association with lower	**LOE: III- A** **Worth to practice: T**he study infers that the HBSNFs lower the readmission rates through better integration of communication and IT resources between acute and post-acute care facilities. **Strengths:** -The study national database and the analysis was extensive. -Study was approved by University of Alabama at Birmingham's IRB **Weaknesses:** -The independent variable was dichotomous which only considered the presence or absence of HBSNFs in hospitals. -The study did not capture the information related to the extent to which the hospitals that have HBSNFs utilize its

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					Sensitivity analysis, using the independent variable with 3 groups (hospitals that never had SNF, hospitals that changed their SNF status, and hospitals that always had SNF), was performed to examine the robustness of the results. SAS 9.3 and STATA 13 were used for data management and analyses	readmission rates for CHF ($\beta = -0.10$, $P < .001$). The hospitals that always had HBSNFs experienced more significant reductions in their readmission rate compared with those that never had one.	services or the nature of coordination. **Feasibility:** Evidence could be used to develop horizontal integration with the SNF when vertical integration is not feasible. **Conclusion:** The study showed that over the years the proportion of hospitals with a SNF was decreasing. As the market is shifting, the hospital and SNFs have to develop interorganizational networks and work on reducing readmissions collaboratively. **Recommendations:** Hospitals can develop strategies with the SNFs in their market such as improved clinician access and better information exchange through shared EHR.
Definition of abbreviations: HBSNF: Hospital-based skilled nursing facility, AMI: acute myocardial infarction, CHF: congestive heart failure, IRB: Institutional Review Board, U.S.: United States, GEE: Generalized estimating equation							

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Hinch, B. K., & Staffileno, B. A. (2021). Implementing a Heart Failure Transition Program to reduce 30-day readmissions. *Journal for Healthcare Quality*, *43*(2), 110–118. https://doi.org/10.1097/JHQ.0000000000000268							
To improve the continuum of care by implementing HF transitional services, thereby decreasing 30-day HF readmissions.	**Design:** Quality Improvement **Method:** Monthly data obtained from November 2016 to September 2017, before and after HFTP implementation through hospital EHR and Vizient Clinical Data Base. **Framework:** American Heart Association (AHA) Scientific Statement on Transitions of Care for Heart Failure Patients: Transitions of Care Recommendations for Clinical Practice	**Sample:** N= 466 patients **Setting:** Large Midwest academic medical center in an urban setting with approximately 700 patients discharged with primary diagnosis of HF annually.	**IV 1:** Comprehensive psychosocial evaluation by the SWCM within 24–48 hours of admission **IV2:** patient education with RN and CM staff **IV 3:** 7 to 10-day post discharge follow-up visit with HFNP **IV 4**: post-discharge PCP visit within 30-day **IV 5**: Post-discharge phone calls within 24-48hrs **IV 6:** Bridge SW call within 5-7 days of discharge **DV:** 30-day HF readmission	Readmission rates and discharge dispositions were obtained monthly through Vizient Clinical Data Base. All other data were extracted through the EMR retrospectively, 31 days after discharge, and stored in a secured database.	Descriptive statistics were used to assess continuous variables, and frequencies were used to assess categorical variables.	Post-HFTP cumulative readmission rate was 18.2% indicating improvement over the 11-month period. 42.7% readmissions occurred during days 1–10 and 34.1% during days 11–20. Among the readmissions, 57.3% were HF related. Only 39.7% of the scheduled patients kept the appointment with HFNP. The 30-day PCP visit was scheduled at discharge in 36.7% of	**LOE**: **V-A** **Worth to practice:** The deployment of high-intensity interventions in this HFTP program aligned with evidence noted in other studies. The project resulted in reduction of HF 30-day readmissions. The interventions are worth to improve continuum of care for HF patients. **Strengths:** The HFTP protocol tested out the AHA framework that included clear guidelines for multidisciplinary team and was led by HFNP. **Weaknesses:** The interventions were primarily done by the acute hospital and collaboration with PAC involved only four preferred home health agencies.

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						patients, and only 37.8% attended the first follow-up visit. The post-discharge calls by HFTP member were consistently high at 92.3%.	**Feasibility:** The NP-led transition program is feasible. **Conclusion(s):** The study reiterates the importance of communication between inpatient and outpatient care teams, especially during the first week post-discharge when the chances of readmission are the highest. **Recommendation(s):** The AHA Transition of Care framework provides recommendations to build foundational interventions that are proven to be successful for HF patients. Resources are finite in the organization therefore only effective and economically sound transition of care interventions should be chosen
Definition of abbreviations: HFTP: Heart Failure Transition Program, AHA: American Heart Association, SW: Social Work, CM: Case Management, NP: Nurse Practitioner, EMR: Electronic Medical Record							

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Jepma, P., Verweij, L., Buurman, B. M., Terbraak, M. S., Daliri, S., Latour, C. H. M., ter Riet, G., Karapinar - Çarkit, F., Dekker, J., Klunder, J. L., Liem, S.-S., Moons, A. H. M., Peters, R. J. G., & Scholte op Reimer, W. J. M. (2021). The nurse-coordinated cardiac care bridge transitional care programme: A randomised clinical trial. *Age and Ageing, 50*(6), 2105–2115. https://doi.org/10.1093/ageing/afab146							
To evaluate the effects of nurse-coordinated 'cardiac care bridge (CCB) transitional care program' on unplanned hospital readmission and mortality.	**Design:** Single-blind, multicenter randomized clinical trial **Method:** Study conducted between 5 June 2017 and 31 March 2020. Approved by the Medical Ethics Committee of the Amsterdam University Medical Center and registered in the Dutch Trial Register. Stratified block randomization to the intervention or control group, allocation ratio 1:1, was used with pre-	**Sample**: 306 patients. Randomized (153/153) Cardiac patients ≥ 70 years that met eligibility criteria **Setting:** Six hospitals surrounding Amsterdam, The Netherlands	**IV: nurse coordinated** Cardiac Care Bridge Program **DV 1:** All- cause unplanned readmissions at 3, 6 and 12 months after randomization **DV 2:** Mortality at 3, 6 and 12 months after randomization	Mortality and readmission data collected from medical files and the Dutch National Personal Records Database. Also, included participants' self-reported readmissions to other hospitals. Data collections were performed by research nurses who were blinded to the treatment allocation.	Both univariate and multivariate analyses were conducted. The treatment effect was expressed as risk differences and risk ratios with corresponding 95% confidence intervals based on chi-square test. All statistical tests were 2-sided. Analyses were performed with SPSS 25.0 and Stata Statistical Software.	Average participant age was 82.4 years (SD 6.3) and 51% male. 58% were admitted for HF diagnosis. The incidence of the 6-month composite outcome of first all-cause readmission or mortality was 54.2% (83/153) in the intervention group and 47.7% (73/153) in the control group (RD 6.5%, 95% CI −4.7–18%, RR 1.14, 95% CI 0.91–1.42, P = 0.341). Similar results with	**LOE: I-A** **Worth to practice**: The nurse-coordinated transitional care interventions were not impactful on the high-risk older cardiac patients which indicates that the selected population may not be responsive to high-intensity preventive strategies and would benefit with more focus on quality of life efforts. **Strengths:** This study invested in an intensive training program and organized regular follow-up meetings -First study to combine case management, disease management and home-based CR in frail older patients with variety of cardiac diagnoses.

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	stratification by study site and cognitive status (MMSE 15–23 vs ≥24). **Framework:** None					multivariable analysis. At three and 12 months after randomization, statistically non-significant differences were found on the composite outcome. The study found that the CCB program did not reduce hospital readmission or mortality within 6 months following hospitalization and there were no statistical difference at 3,6, and12 months.	**Weaknesses:** Only 9% of screened patients were considered eligible for the CCB program. The study was prematurely concluded due to development of regular transitional care for older cardiac patients in the study region. This impacted the power of the study. **Conclusion:** The CCB program may not be beneficial for ~~the~~ frail older cardiac patients. They may benefit from palliative interventions as opposed to preventive interventions. **Recommendation:** Careful consideration should be given when implementing strategies for various age groups.

Definition of abbreviations: CGA: Comprehensive geriatric assessment, PT: Physiotherapy, CN: Community Nurse, MMSE: Mini-mental State Examination, CR: Cardiac Rehab, CCB: Cardiac Care Bridge

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colspan="8"	Naylor, M. D., Hirschman, K. B., Toles, M. P., Jarrín, O. F., Shaid, E., & Pauly, M. V. (2018). Adaptations of the evidence-based Transitional Care Model in the U.S. *Social Science & Medicine, 213*, 28–36. https://doi.org/10.1016/j.socscimed.2018.07.023
Primary aim: To describe and classify common local adaptations of the Transitional Care Model (TCM). **Secondary aim:** To examine transitional care (TC) practitioners' perceptions regarding the effectiveness of their organizations' TC programs, compared to standard care.	**Design:** Mixed-methods research **Method:** *Quantitative phase-* Deployment of survey that resulted in classification of TCM's 10 component's adaptation. Multiple recruitment strategies: *Qualitative phase*: Additional data gathering by structured interviews of sample of survey respondents. **Framework:** Stirman's System of	**Sample:** Online survey- N= 582 respondents. n= 342 (59%) that reported use of TCM. n= 24 randomly selected for interview to expand understanding of nature reasons for TCM adaptations. **Setting:** Respondents well distributed across U.S. Multiple recruitment strategies: -invitations to practitioners	**IV:** Implementation and adaptation of TCM components **Contextual components:** -Hospital to home -Screening -Staffing -Promoting continuity -Fostering coordination -Collaborating **Content components:** -Engaging patients & caregivers -Managing symptoms and other risks -Maintaining relationships - Educating/ promoting self-management **DV1:** Classification of TCM's component	First the quantitative data was collected through survey. Survey questionnaire included 37 close-ended & 1 open-ended question. After analysis a sample was selected for phone interview. The qualitative data was collected via structured phone interview. Guide was developed by the project team. Interviews were recorded,	T-tests used to compare the total TCM components adapted based on the organizational types (eg. hospital vs non-hospital settings). -STATA 14.0 software used for analyses. -Atlas.ti software used for managing data. Through survey results, count and frequencies of adapted TCM's components were analyzed.	Qaulaitative findings: Two teams conducted the TC services. Hospital staff identified high risk patients and community staff did telephone calls and home visits. All interviewees mentioned that TCM was implemented to reduce hospitalizations & rehospitalizations. Quantitative findings: 4% of final sample implemented all 10 components. 96% reported wide range of	**Quantitative:** **LOE: III- A** **Qualitative:** **LOE: III-A** **Worth to practice**: TCM is a well-known model. This study explores the adaptations of TCM model by the organizations as sometimes its not feasible to implement all components of a model. **Strength:** -Robert Wood Johnson Foundation and AHRQ funded the research. - Well-conducted surveys & interviews - From findings, authors presented hypothesis at the end of the study for future research. **Weaknesses:** It would have been good to know if adaptations still improved outcomes.

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
	Classifying Adaptations	who completed the TCM webinar series or who participated in CMS's Center for Medicare and Medicaid Innovation funded initiatives r/t evidence-based TC. -Survey inivitations sent by 32 national organizations to their members - Study information included in organization's e-newsletters.	based on adaptations **DV2:** Perception of effectiveness with total number of TCM adaptations as well as adaptations of individual components.	transcribed and verified for accuracy.	Telephone interviews transcripts were put in data matrix for comparison and identification of themes.	adaptation: 40% (1-3), 43% (4-6), and 17% (7-9). - Mean number of adaptations 4.4. - Adaptations of contextual components very common and no statistical difference based on settings. Top three adaptations were delivering services from hospital to home, relying on APPs and fostering care continuity.	The perceived effectiveness of the adaptations was subjective. **Feasibility:** EBIs that are multicomponent are adapted all the time. **Conclusion:** The knowledge of adaptation is critical as sometimes adaptations may improve outcomes. Also, the adherence to models may create discordance between fidelity and adaptations. **Recommendation:** The knowledge will provide perspective on degree of adaptation of the transition care model.

Definition of abbreviations: TC- Transitional Care, TCM- Transitional Care Model, APP- Advanced Practice Provider, EBI- Evidence-based Intervention

Purpose of article or review	Design / Method / Conceptual framework	Sample / setting	Major variables studied with definitions	Measurement of major variables	Data analysis	Study findings	Level of evidence (critical appraisal score) / Worth to practice / Strengths and weaknesses / Feasibility / Conclusion(s) / Recommendation(s)/
Raat, W., Smeets, M., Janssens, S., & Vaes, B. (2021). Impact of primary care involvement and setting on multidisciplinary heart failure management: A systematic review and meta-analysis. *ESC Heart Failure*, 8(2), 802–818. https://doi.org/10.1002/ehf2.13152							
To compare outcomes of different multidisciplinary HF DMPs in relation to their recruitment setting and involvement of primary care health professionals	**Design:** Systematic review and meta-analysis of RCTs **Method:** Cochrane Collaboration methodology and PRISMA statement -Registered with PROSPERO (registration number CRD42019137637). - Databases: MEDLINE, Embase, and CENTRAL from 1st Jan 2001 to 31st December 2019. -Searched by MeSH & text terms + Boolean operators	**Sample**: Search yield N= 3651 studies n= 19 RCTs met eligibility criteria (7577 patients) Thirteen (5243 patients) in hospital setting and six (2334 patients) in the community	**IV 1:** Recruitment setting **IV 2:** Involvement of PCP **DV:** 1: All-cause readmission 2: HF readmissions 3: All- cause mortality 4: patient-reported outcomes 5: Costs	Quality of evidence was evaluated using Grading of Recommendations Assessment, Development and Evaluation approach.	Three reviewers: first reviewer independently reviewed and categorized the articles. Second reviewer checked all studies that were in 'included' and 'in-doubt' category. Third reviewer reviewed studies on which there were disagreements and final decision was made after discussion. -Quality and risk of bias were assessed using	Multidisciplinary HF DMPs that recruit in the hospital have significant effect on mortality and readmissions as compared to DMPs that recruit in the community. -Multidisciplinary interventions compared with usual care: Reduction in all-cause readmission for (relative risk 0 .89, 95% CI [0 .82, 0 .98]); decrease in HF readmissions (relative risk 0 .76, 95% CI [0 .62 , 0 .93]), decrease in all-cause mortality	**LOE: I-A** **Worth to practice:** PCPs are the key players in HF DMPs. These HF patients often have multiple comorbidities and require PCP oversight. At times these patients have no PCPs and burden falls on HF service. **Strengths:** -Included only RCTs for review and meta-analysis. - Included studies that had greater than 6-month f/u. **Weaknesses:** -Only two studies from USA. - Increased heterogeneity when several interventions were pooled based on their recruitment setting and primary care involvement,

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	Framework: None noted				*Cochrane Handbook for Systematic Reviews of Interventions.* Meta-regression analysis using binary categorical covariates; L'Abbé plots; meta-analyses with inverse variance weighting and random effects in RevMan version 5.3	(relative risk 0.79, 95% CI [0.68, 0.91]). PRO- Studies recruited in the hospital showed improvement in HF-specific QoL, depression scores and self-care. Also showed improved discharged preparedness and quality of TOC. No significant effect size difference noted between recruitment setting and PCP involvement for readmissions and moratlity.	-limited number of studies involving PCP (6/19) that makes results inconclusive. **Conclusion:** It studies the impact of DMP with and without PCP. Even though the results were inconclusive, there is strong recommendation to involve PCP in the HF DMPs. **Recommendation**: High quality evidence on multidisciplinary DMPs impacting HF outcomes. Collaboration with PCPs will be key for successful TOC.
Definition of abbreviations: HF- Heart Failure, DMP- disease management programs, RCT- randomized controlled trial, QoL- Quality of Life, TOC- Transition of Care							

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Radhakrishnan, K., Jones, T. L., Weems, D., Knight, T. W., & Rice, W. H. (2018). Seamless transitions: Achieving patient safety through communication and collaboration. *Journal of Patient Safety*, *14*(1), e3–e5. https://doi.org/10.1097/PTS.0000000000000168							
To describe a collaborative transitional care pilot program (Transitions Across Care Settings [TRACS]) between seven-hospital health system and post-acute senior care service provider.	**Design:** The article mentions it as Case Report

Method: Two healthcare organization partnered and implemented transitional care program (TRACS) for their mutual patients.

Framework: Coleman Care Transitions Intervention model | **Sample**: N= 104 patients

Setting: In Texas, seven-hospital health system & one post-acute care provider with 4-SNF, 1-HH, 1- Hospice.

- Pilot over 12-month period | **IV**: Bundle of one hospital visit, one home visit and three f/u telephone calls over four weeks.

DV: 30-day readmission rate of:
1: AMI
2: CHF
3: Pneumonia | - Patients could self-enroll in TRACS or referred by their physician.
-All referrals were received by TRACS coach through electronic referral system (Curaspan, Newton, MA).
-The coach maintained TRACS database, tracked transfers across the continuum & communicated information with SNF, HH, Hospice and hospital case management | Using TRACS database

Excel (Microsoft, Seattle, WA) database | Overall readmission rate- 4.8%;

Cohort specific readmission rates:
AMI- 0%, CHF- 7.1%, Pneumonia- 4.4%

There is no mention of readmission rate for non-TRACS cohort. | **LOE: V- B**

Worth to practice:
-Demonstrate that large health-systems and post-acute care providers can partner towards efficient TOC model.

Strengths:
-The project received two FTEs to start the TOC model.
- Tailored education on the "4 pillars" of patient self-management
Weaknesses:
-the description of intervention, especially the predischarge visit was not explained.
-Not explained if the readmission rate of enrollees was to same seven facilities or any facilities.
-The pre-intervention readmission rate is not mentioned in the study. |

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				leaders weekly.			- No comparison with non-TRACS cohort's readmission rate. **Feasibility:** Evidence is applicable to build partnership with post-acute care providers. **Conclusion**- Useful for large post-acute care providers to invest in a dedicated coach/liaison to maintain database across systems and be the central point of communication. **Recommendation:** -Higher leadership commitment is key to undertake such collaboration. -Evaluate other studies that have implemented similar multi-system collaboration model with successful outcomes.
Definition of abbreviations: SNF-Skilled Nursing Facility, HH- Home Health, AMI- Acute myocardial infarction, CHF- Congestive heart failure, FTE- full-time equivalents, TRACS- Transitions Across Care Settings							

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Samal, L., Dykes, P. C., Greenberg, J. O., Hasan, O., Venkatesh, A. K., Volk, L. A., & Bates, D. W. (2016). Care coordination gaps due to lack of interoperability in the United States: A qualitative study and literature review. *BMC Health Services Research, 16*, 1–8. https://doi.org/10.1186/s12913-016-1373-y							
To determine, from a clinician perspective, how care is coordinated and to what extent HIT is involved when transitioning patients between emergency departments (ED), acute care hospitals (ACH), skilled nursing facilities (SNF), and home health agencies (HHA) in settings across the United States	**Design:** Qualitative study with focus group interviews and structured literature review

Method: Clinicians and IT professionals were chosen from six regions of U.S. to participate in the focus group interviews. Authors also conducted literature review of MEDLINE, CINAHL, and Embase with no date restrictions, to analyze studies that included interventions to improve information | **Sample:** N=29 respondents.

N= 10 articles for literature review

Setting: Respondents were distributed across U.S. | **IV 1:** Focus group interviews

DV: Use of HIT for care coordination activities | Six one-hour 'focus group-style interviews' with clinicians and IT professionals were conducted. by two co-investigators over the telephone following a semi-structured interview guide. The interviews were conducted between May and June 2012. Codes were assigned to variables. For reporting ease, the variables were | Verbatim transcriptions of interviews were entered into QSR NVivo for coding and analysis.

The care coordination domains were categorized in three levels: provider-level, patient-level and system-level. The interview responses were analyzed at each level for current capability of HIT and its future potential. | Significant gaps in information transfer, systems to monitor patients, tools to support patients' self-management goals and tools to link patients and their caregivers with community resources. Key barrier to effective HIT interventions is the lack of interoperability between EHRs, patient HIT tools, and community organizations' HIT tools. EHR are highly adopted | **LOE: III-B**

Worth to practice: The interoperability challenges are still existing even after a decade. With the advances in HIT, it is worth to pursue the solutions, especially around electronic transfer of information between facilities, linkage to community resources, and development care pathways.

Strengths: The study presents the primary data about care coordination gaps across diverse clinical settings and medicine and nursing disciplines.

Weaknesses: Purposive sampling of the health system in small number of settings that limits |

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	transfer during transitions of care. **Framework:** Agency for Healthcare Research and Quality (AHRQ) Care Coordination Measurement Framework			categorized in three levels: provider-level, patient-level and system-level.		in hospital, ED, SNF and HHA but it is not interoperable, where these organizations can send and receive information electronically. Authors provide few recommendations on HIT innovations such as longitudinal care plan and linking patients to community resources using their zip code.	generalization. The interview guide was self-developed and being structured, it limits alteration of questions. **Feasibility:** Deploying HIT tools will depend upon the organizations' EHR capabilities and financial support. **Conclusion:** The study provides insight into the HIT related care coordination gaps and where there is better potential for innovation. **Recommendations:** The evidence from the study should be used for HIT innovations across the continuum. This would improve the quality-of-care coordination and thereby improve outcomes such as reduction in readmissions and medication errors.
Definition of abbreviations: AHRQ: Agency for Healthcare Research and Quality, HIT: Health Information Technology, ED: Emergency Department, SNF: Skilled Nursing Facility, HHA: Home Health Agency							

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colspan="8"	Summers, M. L., & Atav, S. (2020). Reducing hospital readmissions in Upstate New York: Teasing out the effective programs. *Professional Case Management, 25*(1), 26–36. https://doi.org/10.1097/NCM.0000000000000371
To identify hospital programs, organizational characteristics, and levels of nursing involvement in hospital programs that contribute significantly to reductions in readmission rates and reimbursement penalties	**Design:** Ex post facto design; Nonexperimental **Method:** For the study, hospitals ranging from metropolitan to rural status were selected from upstate New York. Hospitals located near the New York City metropolis were excluded to ensure equitable representation. **Framework:** Synthesis of Ecological and Synergy models	**Sample:** N= 94 hospitals **Setting:** Upstate New York (53 counties)	**IV 1:** Hospital readmission reduction programs **IV 2:** Organizational characteristics **IV 2:** Levels of nursing involvement in hospital programs **DV 1:** Hospital readmission rates **DV 2:** Reimbursement penalties	Data from CMS, Agency for Healthcare Research and Quality, NYSDOH, and specific hospital websites. When specific data were not available from hospital websites, hospital personnel were contacted by phone.	Bivariate analyses to assess whether there were significant differences in mean readmission rates and reimbursement penalties. Pearson correlation coefficient used to calculate relationship between the number of HRRP initiatives employed by hospitals and the various readmission and reimbursement outcomes. For the	Hospitals collaborating with certified home health agencies showed lower overall readmission rates than hospitals that did not. When hospitals utilized a post discharge phone call, readmission rates related to heart failure were higher. Hospitals collaborating with certified home health agencies, utilizing telehealth, or utilizing house calls showed lower PNA readmission	**LOE: III- B** **Worth to practice:** Higher the number of HRRP initiatives, better outcomes in terms of readmissions and thus lower reimbursement penalties. Collaboration with home health agencies had positive impact on readmission reduction. **Strengths:** Since it is a correlational study, the scope of generalization is better. The direction and strength of relationship of variables on outcomes will guide future studies on collaboration with post-acute care facilities. **Weaknesses:** The study did not list any limitations. The independent variable lacks the details for replication.

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					independent variables with three or more groups, such as the level of nursing, analysis of variance (ANOVA) was used.	rates.Hospitals utilizing house calls and higher number of HRRP initiatives showed lower reimbursement penalties. APNs on the interdisciplinary team had a lower excess readmission ratio for pneumonia than hospitals with just RN or RN-led interdisciplinary teams.	**Feasibility:** Interventions require collaboration with multidisciplinary teams- internally and externally. Resources would be required to arrange house calls, telehealth and discharge phone calls. **Conclusion:** The readmission reduction can be achieved mostly through the bundle of high-intensity interventions. **Recommendations:** The HRRP initiatives have shown to reduce readmissions. Organizations should support collaboration with post-acute care facilities and build a strong case management team.
Definition of abbreviations: HRRP: Hospital Readmission Reduction Program, RN: Registered Nurse, NYSDOH: New York State Department of Health, CMS: Center for Medicare and Medicaid Services, HRRP: Hospital Readmission Reduction Program							

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\multicolumn{8}{l}{Vedel, I., & Khanassov, V. (2015). Transitional care for patients with congestive heart failure: A systematic review and meta-analysis. *Annals of Family Medicine, 13*(6), 562–571. https://doi.org/10.1370/afm.1844}							
To determine the impact of transitional care interventions (TCIs) on acute health service use by patients with congestive heart failure in primary care and to identify the most effective TCIs and their optimal duration	**Design:** Systematic review and meta-analysis of RCTs **Method:** Cochrane Collaboration methodology. Databases: MEDLINE, PsycINFO, EMBASE, and Cochrane Database of Systematic Reviews from 1995 to Feb 6, 2014. Language-English & French. Key words: Heart failure, transition, care planning & discharge. Outcomes reviewed	**Sample**: N= 11,423 studies n=41 RCTs that met eligibility criteria (RCTs and participating patients with CHF diagnosis on discharge. **Setting:** identified databases	**IV 1:** Transitional Care Interventions: Predischarge education by CHF nurse either via written material or video **IV2:** Discharge plan (Med review, individualized care plan & DC letter to PCP/cardiologist) **IV3:** Structured, proactive and prearranged f/u. **DV1:** All-cause readmission **DV2:** All- cause ED visits	Quality of studies was assessed by critical appraisal, the Downs and Black Scale. Team of experts created a taxonomy to classify TCI into homogenous group of interventions and their intensity.	Two reviewers independently examined the references based on the eligibility criteria. Full text of selected references were further reviewed per criteria. Used random-effects models to study the effect of different interventions. I^2 statistic used for measuring heterogeneity.	-Two critical TC elements were home visits by a nurse, and number of follow-up. - Home visits led to a reduction of readmissions, whereas phone calls did not. Home visits also eliminated transportation to the physicians' offices and pharmacies, among the main contributors to readmission of older patients. Frequency of visits also impacted long-term outcomes.	**LOE: I-A** **Worth to practice:** High-intensity interventions and their durations impact risk of readmission. It would be beneficial to assess the frequency of such interventions. **Strengths:** -Study included 41 RCTs. - the data analysis was very comprehensive. - the measurement of intensity of the intervention was unique to this study **Weaknesses:** -None from the study itself. But the some of the RCTs had limited information on number of contacts and patient characteristics such as comorbidities and severity of CHF

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	between TCI group and the usual care group. **Framework:** PRISMA framework for reporting the results					Relative risk of readmission with a TCI as compared with usual care (RR=0.92; 95% CI, 0.87- 0.98), indicating that TCI reduces the risk of readmission by an average of 8%. 29% reduction in the risk of ED visits for TCI as compared with usual care (RR=0.71; 95% CI, 0.52-0.98). High-intensity interventions are efficacious at reducing the risk of readmission	**Conclusion:** Just the implementation of TCI is not sufficient to impact outcome. The intensity of the intervention is also critical. **Recommendation**: High quality evidence on certain interventions when combined over a consistent period creates maximum benefit. A combination of home visits with other types of follow-ups (telephone and/or clinic follow-up) or Telecare combined with prearranged direct contact with patients (e.g., home visits, telephone follow-up, video visits)
Definition of abbreviations: TCI- Transitional Care Interventions, CHF- Congestive Heart Failure, DC- Discharge, ED- Emergency Department, RCT- Randomized Control Trial							

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Weerahandi, H., Bao, H., Herrin, J., Dharmarajan, K., Ross, J. S., Jones, S., & Horwitz, L. I. (2020). Home health care after skilled nursing facility discharge following heart failure hospitalization. *Journal of the American Geriatrics Society*, 68(1), 96–102. https://doi.org/10.1111/jgs.16179							
To study if home health care affects readmission during the transition from SNF to home after HF hospitalization	**Design:** Retrospective cohort study; Observational design **Method:** Medicare Standard Analytic Files were used to identify admissions to hospital & SNF. Merged with Medicare Denominator files that contained patient-level information. Excluded cases with admissions 30 days after hospital discharge and admissions less than one day in SNF.	**Sample:** N= 67,585 DC with HHC- 13,257 (19.6%) DC without HHC- 54,328 (80.4%) Beneficiaries, aged ≥ 65yrs with HF diagnosis discharged to SNF and then discharged home. **Setting:** Fee-for-service Medicare database, 2012 to 2015	**IV 1:** Discharge from SNF to home with HHC **DV 1:** Unplanned readmissions within 30-day of discharge to home from SNF **DV2:** Readmission rate for patients with and without HHC services	Unplanned readmissions per CMS's methodology.	Comparison done using descriptive statistics, Elixhauser comorbidity scores. The time to unplanned readmission was compared using a multivariable Cox proportional hazards model. Pt discharged with HHC were more likely to be female, ~~to be~~ black, and ~~to~~ have shorter SNF LOS as compared to those without. Pt with HHC	Readmission Rate for: DC with HHC- 22.8% DC without HHC- 24.5% The risk od readmission is lower in patients discharging with HHC than those discharged home without HHC. The days between readmission is longer for patient discharged with HHC (11days) as compared to those without (9 days)(P < 0.0001). This was new	**LOE: III-A** **Worth to practice**: patients transferred to SNF has been increasing over the years considering some functional impairment. Chances of readmissions are high in this population. This study shows that having HHC after SNF DC decreases the readmission risk. **Strengths:** This work received research grant from AHRQ, the National Center for Advancing Translational Sciences, and National Heart, Lung, and Blood Institute of National Institutes of Health. -First study to use national data set to look at HHC impact from SNF to home discharges

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	Framework: None				were also more likely to be discharged from SNF with more PT hours per resident per day and higher total nurse staffing hours per resident per day at their home (not in the SNF facility).	knowledge as patients discharged with HHC usually require additional restorative services.; however, only 20% received HHC services. Mortality without readmission within 30 days was lower (3.1%) in pts discharged with HHC vas 4.1% for those without.	**Weaknesses:** -Observational designs preclude causal inferences. -The SNF quality of care data was available only from 2016 to 2018 which does not reflect the quality from 2012 to 2015. **Conclusion:** Only 20% of HF patients receive HHC after SNF discharge. **Recommendation:** The transition from hospital to home and from SNF to home can be supported by home health care but the utility is very low.
Definition of abbreviations: HHC- Home Health Care, SNF- Skilled Nursing Facility, AHRQ- Agency for Healthcare Research and Quality, LOS- Length of Stay							