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Articles

A Social Determinants and Transitional Care Framework for Reducing Heart Failure Readmissions in Urban Safety-Net Hospitals

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ABSTRACT

Heart failure (HF) is one of the most common reasons adults return to hospital shortly after discharge, and urban safety-net hospitals bear a heavier share of this burden than other institutions. Their patients are more likely to live with low income, unstable housing, food insecurity, limited English proficiency, and weak links to outpatient care, and these conditions make it difficult to obtain medications, monitor symptoms, and attend follow-up during the weeks after discharge. Transitional care programs have reduced readmissions in many settings, yet they have generally been designed around education and clinical follow-up, treating social circumstances as background barriers rather than as conditions that care can change. This conceptual study addresses that gap by developing a framework that brings the social determinants of health into the design of transitional care for adults hospitalized with HF in urban safety-net hospitals. The framework was built through theory synthesis and integrative review, drawing together perspectives on the social determinants of health, multilevel influences on behavior, the experience of care transitions, and self-care in chronic illness. The resulting model explains that unmet social needs raise readmission risk both directly and by weakening self-care, medication adherence, and timely follow-up. It proposes that hospitals respond by identifying social needs during admission, matching the intensity of support to combined clinical and social risk, adapting the discharge plan to each patient's circumstances, sustaining contact through community health workers and early follow-up, and connecting patients to community services until their needs are resolved. These processes are expected to reduce readmissions and improve survival, quality of life, and costs, while narrowing the gap in outcomes between socially advantaged and disadvantaged patients. The framework is set within the financial, organizational, and policy realities of safety-net hospitals and recognizes that clinical severity and patient preferences shape what care is appropriate. It is accompanied by testable propositions, construct definitions, and candidate measures, and by guidance on implementation and evaluation in resource-constrained settings. The study concludes that treating social risk as a modifiable part of transitional care offers a practical and equitable route to fewer heart failure readmissions, and it provides clinicians, nurse leaders, and researchers with a structured basis for designing, testing, and scaling such interventions.

Introduction

Heart failure (HF) affects approximately 6.7 million adults in the United States, and its prevalence is projected to keep rising as the population ages and survival after myocardial infarction improves (Tsao et al., 2023). HF is

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also one of the most common reasons for hospitalization among older adults, and roughly one in four patients discharged with HF is readmitted within 30 days (Jencks et al., 2009). These readmissions are costly, distressing for patients and families, and frequently linked to factors that arise after discharge, such as gaps in medication access, missed follow-up, and difficulty recognizing early signs of decompensation (Krumholz, 2013).

The burden of HF continues to grow worldwide, driven by population aging, improved survival after acute coronary events, and a rising prevalence of hypertension, diabetes, and obesity (Dunlay & Roger, 2014; Ziaeian & Fonarow, 2016). National data show that roughly one quarter of patients hospitalized with HF return within 30 days, a figure that changed little for years despite growing attention (Bergethon et al., 2016; Ross et al., 2010). Readmissions occur for a wide range of diagnoses, not only recurrent HF, and cluster in the first weeks after discharge (Dharmarajan et al., 2013), which led Desai and Stevenson (2012) to ask whether the field should concentrate on predicting readmissions or on preventing them.

In 2012 the Centers for Medicare & Medicaid Services (CMS) began imposing financial penalties on hospitals with higher than expected readmission rates for HF and other conditions through the Hospital Readmissions Reduction Program (HRRP). Early analyses found that hospitals caring for the largest proportions of low-income patients were more likely to be penalized (Joynt & Jha, 2013), and that adjusting for social risk factors meaningfully changed hospital performance rankings and penalty assignments (Joynt Maddox et al., 2019). Safety-net hospitals therefore face a double bind: they serve patients whose social circumstances raise readmission risk, and they operate with thinner margins that make it harder to invest in the services that could lower that risk (Popescu et al., 2019).

Evaluations of the HRRP have reached mixed conclusions. Readmission rates fell after the program was announced (Wasfy et al., 2017; Zuckerman et al., 2016), but analyses differ on whether postdischarge mortality for HF rose as a consequence (Khera et al., 2018; Wadhera et al., 2018). Patient characteristics that standard risk adjustment does not capture explain a meaningful share of the variation in hospital readmission rates (Barnett et al., 2015), readmission rates are higher for Black patients and for the hospitals that disproportionately serve them (Joynt et al., 2011), and even within a single urban teaching hospital, neighborhood socioeconomic status predicts readmission (Hu et al., 2014). Safety-net hospitals report more barriers to reducing readmissions yet use fewer of the recommended strategies (Figueroa et al., 2017).

Transitional care, defined as a set of time-limited services that ensure continuity and coordination as patients move between settings, has strong evidence for reducing HF readmissions. Meta-analyses show that home-visiting programs, multidisciplinary HF clinics, and nurse-led transitional care reduce all-cause readmission and mortality (Feltner et al., 2014; Van Spall et al., 2017). However, most landmark trials enrolled patients from academic or integrated systems, and few interventions were built around the social conditions that determine whether patients can act on discharge teaching. A scientific statement from the American Heart Association concluded that social determinants of health (SDOH) are strongly associated with HF incidence, hospitalization, and mortality, and called for interventions that address them directly (White-Williams et al., 2020).

Broader systematic reviews confirm that multicomponent interventions that begin before discharge and continue afterward are the most effective in preventing readmission (Hansen et al., 2011; Leppin et al., 2014), and the American Heart Association has called for HF transitions of care to be organized around patient needs and shared accountability across settings (Albert et al., 2015).

Background

This section situates the problem by reviewing heart failure readmission as a transitional problem, the social determinants that shape heart failure outcomes, the urban safety-net context, and existing transitional care and social needs interventions.

Heart Failure Readmission as a Transitional Problem

Readmission after HF hospitalization reflects both the biological fragility of the syndrome and the vulnerability of the transition period. Krumholz (2013) described a post-hospital syndrome in which sleep disruption, deconditioning, nutritional depletion, and cognitive stress leave patients at elevated risk for a broad range of conditions in the weeks after discharge. During this window, patients must reconcile new or changed medications, monitor daily weight, restrict sodium and often fluid, recognize congestion early, and attend follow-up. Early outpatient follow-up within 7 days of discharge is associated with lower 30-day readmission (Hernandez et al., 2010), and guideline-directed medical therapy (GDMT) requires frequent titration visits and laboratory monitoring (Heidenreich et al., 2022). Each of these tasks presumes resources that many safety-net patients do not reliably have.

Social Determinants of Heart Failure Outcomes

Healthy People 2030 groups social determinants into five domains: economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context (Office of Disease Prevention and Health Promotion, 2020). Evidence links each domain to HF outcomes. A systematic review found that social factors including low socioeconomic status, social isolation, and inadequate social support were associated with higher readmission or mortality after HF hospitalization (Calvillo-King et

al., 2013). Patients living in the most disadvantaged neighborhoods, measured by the Area Deprivation Index, have higher 30-day rehospitalization rates than patients in less disadvantaged areas, independent of clinical risk (Kind et al., 2014). Low health literacy is common in HF and is independently associated with higher mortality (Peterson et al., 2011). Food insecurity forces trade-offs between buying food and buying medications, producing cost-related medication underuse (Berkowitz et al., 2014). Pharmaceutical supply chain inefficiencies and high out-of-pocket prices compound this problem in resource-constrained systems by making chronic therapies unaffordable or intermittently unavailable (Asiedu & Asiedu, 2023), and last-mile distribution barriers further limit medicine access in underserved communities (Asiedu & Asiedu, 2022). Structural racism shapes the distribution of these exposures, so that Black and Hispanic patients are overrepresented in the communities that safety-net hospitals serve (White-Williams et al., 2020).

These findings are consistent with a broader literature linking social conditions to cardiovascular disease. American Heart Association statements describe socioeconomic position, race and ethnicity, social support, culture, access to care, and residential environment as determinants of cardiovascular risk and outcomes (Havranek et al., 2015; Schultz et al., 2018). Neighborhood deprivation predicts incident HF among low-income Black and White adults (Akwo et al., 2018), and in a national cohort the number of social determinants a patient experienced was associated with higher 90-day mortality after HF hospitalization (Sterling et al., 2020). Low health literacy predicts hospitalization and death in HF (Cajita et al., 2016; Moser et al., 2015), social support is associated with better self-care and fewer readmissions (Luttik et al., 2005), and perceived social isolation is associated with higher risks of hospitalization and death (Manemann et al., 2018). Food insecurity is associated with chronic disease among low-income adults (Seligman et al., 2010), housing instability and food insecurity act as barriers to obtaining care (Kushel et al., 2006), and transportation barriers lead to missed appointments and delayed care (Syed et al., 2013).

Access to GDMT depends on availability as well as price. Out-of-pocket costs for quadruple therapy for HF with reduced ejection fraction can be substantial for Medicare beneficiaries (Faridi et al., 2022), and upstream supply problems compound affordability. Work on pharmaceutical supply chain resilience (Awulu et al., 2022), drug shortage early warning (Eze et al., 2022), governance that links supply chain management to sustainable access to essential medicines (Eze et al., 2023), manufacturing quality assurance as a determinant of supply reliability (Asiedu & Asiedu, 2024b), traceability across distribution networks (Aneke & Adesemoye, 2019), and regulatory harmonization of medicine quality (Aneke et al., 2024) shows how many links in the chain determine whether a patient receives a consistent supply. Lean methods have been applied to pharmacy distribution bottlenecks (Obukadata et al., 2021), procurement resilience frameworks address post-pandemic pharmaceutical operations (Akinleye, 2024), resilience indices have been proposed for post-pandemic supply chains (Efobi et al., 2023), and machine learning dashboards can flag risk in hospital supply chains (Filani et al., 2022). Pharmacy-led delivery models further illustrate how access to medicines can be extended beyond the hospital walls (Ilodigwe & Adesemoye, 2020).

These determinants do not act only as background risk. They operate through identifiable mechanisms: a patient without a scale cannot monitor daily weight; a patient without transportation misses the 7-day visit; a patient who cannot afford a sodium-glucose cotransporter 2 inhibitor stops taking it; a patient who lives alone has no one to notice worsening dyspnea. Because these mechanisms are concrete, many are modifiable through deliberate design of transitional care.

Housing and energy conditions deserve particular attention. Socioeconomic factors shape the affordability and sustainability of urban housing (Gil-Ozoudeh et al., 2018), and research on low-cost building materials for low-income housing (Nwafor, Uduokhai, et al., 2019), public-private partnerships for affordable housing (Uduokhai et al., 2022), housing policy implementation (Uduokhai, Nwafor, et al., 2023), and resident satisfaction in government-sponsored housing (Uduokhai, Garba, et al., 2023) shows how policy and design influence whether housing is stable and adequate. Flood vulnerability adds environmental risk to housing insecurity in many cities (Nwafor, Giloid, et al., 2019). For patients with HF, utility affordability affects refrigeration, cooling during heat waves, and the operation of home monitoring devices; studies of community affordability in energy systems for underserved regions (Komi & Adeniji, 2020), of lifecycle equity in energy storage for weak-grid regions (Komi & Ganiu, 2022), and of equity in load forecasting across districts (Komi, 2023) show that energy access is unequally distributed. Climate exposures are also increasingly incorporated into mortality risk prediction (Oparah et al., 2024).

The Urban Safety-Net Context

Safety-net hospitals are commonly defined by a high share of Medicaid and uninsured patients or a high disproportionate share hospital patient percentage (Popescu et al., 2019). Urban safety-net hospitals typically serve dense, racially and linguistically diverse populations with high rates of multimorbidity, behavioral health conditions, and housing instability. They often have fewer resources for post-discharge nursing, limited affiliated primary care capacity, and patient populations that move among multiple health systems. At the same time,

they frequently have strengths that can be leveraged, including community health worker (CHW) programs, partnerships with community-based organizations, and institutional missions that prioritize equity. Workforce constraints are also common in public hospitals, and governance approaches to nurse staffing and workload planning shape how much time nurses can devote to discharge preparation (Omaghomi et al., 2023). Since fiscal year 2019, the HRRP has compared hospitals within peer groups defined by the proportion of patients dually eligible for Medicare and Medicaid, a policy change that acknowledged social risk but did not by itself supply the means to address it. Beginning in 2024, CMS also required hospitals participating in the Inpatient Quality Reporting Program to report screening for social drivers of health, which creates both an obligation and an opportunity to connect screening with action (Centers for Medicare & Medicaid Services, 2022).

Infrastructure and organizational capacity shape what safety-net hospitals can deliver. Health care infrastructure investment functions as a public health intervention (Aminu-Ibrahim & Ogbete, 2023) and can expand diagnostic access in underserved regions (Aminu-Ibrahim et al., 2020), but its value depends on translating investment into measurable population health outcomes (Ogbete & Aminu-Ibrahim, 2024), on accountable governance of public-private partnerships (Aminu-Ibrahim et al., 2024), and on sound risk management in health care projects (Amayo et al., 2023). Urban hospitals also face preparedness demands that compete for the same resources (Akinlolu et al., 2024). Adopting new diagnostic technologies brings its own barriers of cost, staff training, and workflow redesign (Abdulrazaq et al., 2021). Health insurance financing and provider payment design determine how much financial protection patients have (Ilodigwe & Adesemoye, 2019a), and resilient health systems depend on organizational strategy, operational excellence, and workforce capability rather than technology alone (Ilodigwe & Adesemoye, 2024b).

Existing Transitional Care and Social Needs Interventions

Three established models anchor current practice. The Transitional Care Model uses advanced practice nurses who begin planning in the hospital and continue home visits and telephone follow-up after discharge; in a trial of older adults with HF it reduced readmissions and costs (Naylor et al., 2004). The Care Transitions Intervention uses a transition coach and a personal health record to build patient self-management across four pillars: medication self-management, a patient-centered record, follow-up, and knowledge of red flags (Coleman et al., 2006). Project RED standardized a reengineered discharge with a patient-friendly after-hospital care plan and post-discharge pharmacist calls, reducing hospital utilization in an urban safety-net population (Jack et al., 2009). More recently, the Patient-Centered Care Transitions in HF trial showed that a nurse-led, multicomponent transitional care model improved patient-reported outcomes and showed signals of benefit on composite outcomes (Van Spall et al., 2019).

Other studies reinforce these lessons. Comprehensive discharge planning with home follow-up by advanced practice nurses reduced readmissions among older adults (Naylor et al., 1999), a transitional care program for HF lowered readmissions and costs in a community health system (Stauffer et al., 2011), and hospitals with the lowest HF readmission rates tend to partner with community physicians, arrange follow-up before discharge, and assign clear responsibility for medication management (Bradley et al., 2013). Naylor et al. (2011) argued that transitional care is central to health reform because it closes gaps that fragmented systems create. Telemonitoring has produced mixed results: it did not reduce readmission or death in two large U.S. trials (Chaudhry et al., 2010; Ong et al., 2016) but reduced days lost to unplanned admission and all-cause mortality when embedded in a structured telemedical management program (Koehler et al., 2018).

Community health worker programs have the strongest evidence for addressing social needs directly. The IMPaCT model improved access to primary care and reduced hospital days in a multisite trial (Kangovi et al., 2018) and returned a positive return on investment to Medicaid (Kangovi et al., 2020), consistent with a systematic review showing that CHW interventions improve chronic disease outcomes among vulnerable populations (Kim et al., 2016). Medically tailored meals and meal delivery programs reduce health care use among high-need patients (Berkowitz et al., 2018, 2019), and postdischarge home-delivered meals for HF showed feasibility and signals of benefit (Hummel et al., 2018). A systematic review of interventions targeting patients' social and economic needs found promising but heterogeneous evidence (Gottlieb et al., 2017), the National Academies of Sciences, Engineering, and Medicine (2019) recommended that health systems integrate social care through awareness, adjustment, assistance, alignment, and advocacy activities, and Andermann (2016) offered a practical framework for clinicians to act on social determinants at the patient, practice, and community levels.

These models emphasize education, medication reconciliation, and clinical follow-up, but they generally treat social needs as barriers to be noted rather than targets to be resolved. Recent care-coordination frameworks for chronic disease likewise identify coordination across settings as the main lever for reducing readmissions, but stop short of specifying how social risk should change the intensity of care (Akinlolu et al., 2023), and analyses of home health services point to administrative fragmentation as a hidden source of discontinuity after

discharge (Ogundipe & Ominde, 2024). In contrast, CHW interventions such as IMPaCT, which pair patients with trained community members who help them pursue their own goals and address social needs, reduced repeat hospitalizations and improved access to primary care among low-income patients (Kangovi et al., 2014). Care plans that integrate behavioral, medical, and community services for underserved urban populations move in the same direction (Peteranaba et al., 2024). The evidence thus includes strong transitional care models and promising social-needs interventions, but few frameworks explicitly integrate the two or specify how social risk should change the content and intensity of transitional care. The SDTC Framework is designed to fill this gap.

Aim of the Study

The purpose of this paper is to propose a conceptual framework that integrates SDOH with evidence-based transitional care for adults hospitalized with HF in urban safety-net hospitals. The Social Determinants and Transitional Care (SDTC) Framework is intended to (a) describe how social determinants act on readmission risk, (b) specify how transitional care can be redesigned to target those pathways, (c) identify the mechanisms through which effects occur, and (d) generate testable propositions for research and quality improvement. Its distinguishing feature is that social risk is treated as a modifiable target of transitional care, with screening results determining both the intensity and the content of the care each patient receives, rather than as a background characteristic recorded for risk adjustment. Section 2 describes the research method and the theoretical foundations used in the synthesis, Section 3 presents and discusses the framework, its propositions, its implementation, and its implications and limitations, and Section 4 concludes.

Research Method

Research Design and Approach

This is a conceptual paper that develops a framework through theory synthesis and integrative review rather than primary data collection. Theory synthesis combines concepts and relationships from existing theories and empirical findings into an integrated representation of a phenomenon (Walker & Avant, 2019). The procedure followed the steps described by Jabareen (2009) for building conceptual frameworks: mapping the relevant literature, identifying and naming concepts, deconstructing and categorizing them, integrating concepts that overlap, synthesizing them into a coherent structure, and checking the result against existing evidence. It also responds to the argument that scientific advances fail to improve patient outcomes without effective health care delivery systems (Ilodigwe & Adesemoye, 2019b).

Sources were drawn from cardiology, nursing, health services research, public health, and implementation science, and from adjacent fields that address health infrastructure, pharmaceutical supply, data governance, operations, and workforce, so that the framework would reflect the organizational conditions of safety-net hospitals as well as clinical evidence. Randomized trials, systematic reviews, scientific statements, and clinical guidelines were given priority for claims about effectiveness, while conceptual and applied studies informed organizational and implementation constructs. Concepts were retained when they (a) had an empirical link to HF readmission or to the processes of the transition period, (b) were modifiable or measurable within a hospital and its community, and (c) could be operationalized with existing measures. The retained constructs were grouped into domains, the relationships among them were stated as propositions, and candidate measures were identified for each construct to support empirical testing.

Theoretical Foundations

The SDTC Framework draws on four complementary theoretical sources. Each contributes a distinct element, and together they explain why social conditions affect readmission, at which levels interventions should act, what is happening to the patient during the transition, and through which behavioral mechanisms change occurs.

WHO Conceptual Framework for Action on the Social Determinants of Health

The World Health Organization framework distinguishes structural determinants, such as socioeconomic position shaped by policy, governance, and social values, from intermediary determinants, such as material circumstances, psychosocial factors, behaviors, and the health system itself (Solar & Irwin, 2010). Two features of this model are central to the SDTC Framework. First, the health system is named as an intermediary determinant, which means that the design of transitional care can either buffer or amplify the effects of social disadvantage. Second, the model links individual-level circumstances to their structural origins, which supports including structural racism and neighborhood disadvantage as framework constructs rather than treating them as unmeasured confounders. This view aligns with foundational work on social determinants and health inequalities (Marmot, 2005; Marmot et al., 2008) and with calls to address the causes of the causes of poor health (Braveman & Gottlieb, 2014). Structural racism, operating through housing, employment, policing, and health care, is a fundamental driver of these inequities (Bailey et al., 2017; Churchwell et al., 2020).

Social Ecological Model

The social ecological model holds that behavior is shaped by intrapersonal, interpersonal, organizational,

community, and policy influences (McLeroy et al., 1988). Applied to HF transitions, it implies that improving self-care requires more than patient education; it also requires engaging caregivers, redesigning hospital workflows, partnering with community organizations, and responding to payment policy. The SDTC Framework uses this model to locate each intervention component at an appropriate level and to frame the safety-net hospital and its policy environment as the context within which all other constructs operate. Integrative models developed for other populations, such as maternal health programs that pair clinical care with responses to socioeconomic inequity, illustrate the value of this multilevel design (Akinse et al., 2023).

Transitions Theory

Meleis and colleagues described transitions as passages from one fairly stable state to another, shaped by personal, community, and societal conditions that can either facilitate or inhibit healthy outcomes (Meleis et al., 2000). The theory identifies process indicators, such as feeling connected, interacting, and developing confidence, and outcome indicators, such as mastery and fluid integrative identity. Transitions theory justifies the framework's attention to the meaning of discharge for the patient, the importance of continuity and trust, and the treatment of social conditions as transition conditions that nursing can assess and modify.

Self-Care and Health Services Use

Riegel et al. (2012) defined self-care as a process of maintaining health through health-promoting practices and managing illness, consisting of self-care maintenance, self-care monitoring, and self-care management. Self-care in HF is influenced by experience, knowledge, skill, cultural beliefs, functional and cognitive abilities, confidence, habits, and support from others. This theory specifies the behavioral mechanism through which much of transitional care operates and explains how social determinants exert their effects: by constraining the resources and conditions that self-care requires. It also supplies validated measurement through the Self-Care of Heart Failure Index. Work in psychiatric rehabilitation that treats support for activities of daily living as a clinical intervention, rather than an ancillary service, offers a useful parallel for building these skills during the transition (Osinem et al., 2021).

Andersen's behavioral model of health services use further informs the framework by distinguishing predisposing, enabling, and need factors that determine whether people obtain care (Andersen, 1995). Enabling resources such as income, insurance, transportation, and a regular source of care map directly onto the social determinants targeted by the framework and help explain missed post-discharge follow-up.

Results And Discussion

The synthesis produced the Social Determinants and Transitional Care (SDTC) Framework. Sections 3.1 to 3.7 present the framework, its four domains, its context and moderators, and its propositions. Section 3.8 describes how the framework can be applied, implemented, and evaluated, and Sections 3.9 and 3.10 discuss its implications and limitations.

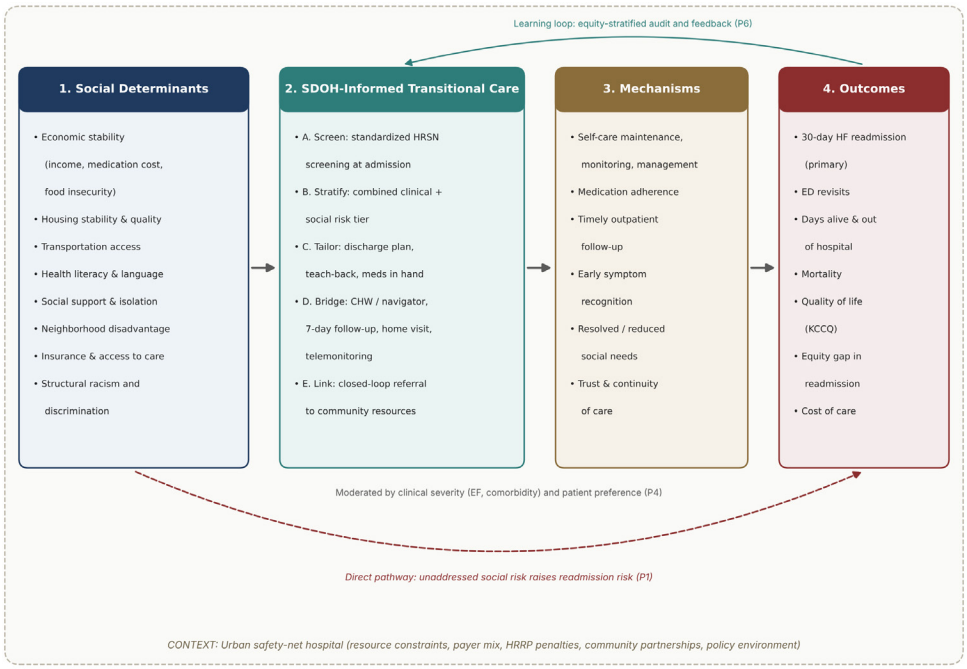
Overview and Assumptions of the SDTC Framework

The SDTC Framework proposes that social determinants influence HF readmission through two pathways: a direct pathway, in which unaddressed social risk raises the probability of readmission, and an indirect pathway, in which social risk erodes the mechanisms (self-care, adherence, follow-up, and early recognition) that transitional care depends on. The framework further proposes that transitional care redesigned around identified social needs can interrupt both pathways. Figure 1 displays the framework.

The framework rests on five assumptions. First, social risk is at least partly modifiable during the transition period. Second, a hospital admission is an opportunity to identify social needs that are otherwise invisible to the health system. Third, transitional care intensity should be proportional to combined clinical and social risk, consistent with the principle of proportionate universalism. Fourth, patients are experts in their own circumstances, so tailoring should follow patient priorities. Fifth, equity is an outcome to be measured, not only a value to be stated.

Domain 1: Social Determinants

The first domain contains the social conditions most consistently linked to HF outcomes and most relevant to the tasks of the transition period. Economic stability includes income adequacy, cost-related medication nonadherence, and food insecurity, which together determine whether a patient can fill prescriptions and follow a low-sodium diet. Housing stability and quality determine whether a patient has a place to store medications, a scale, and refrigeration, and whether discharge can occur to a safe setting. Transportation access determines attendance at follow-up visits, laboratory checks, and cardiac rehabilitation. Health literacy and language determine whether discharge instructions are understood and acted on. Social support and isolation determine whether someone can help with daily weights and recognize decline. Neighborhood disadvantage captures area-level conditions such as food environment and safety. Insurance and access to care capture coverage gaps and the availability of a usual source of care. Structural racism and discrimination are included because they shape exposure to all other determinants and influence trust in the health system.



Note. HRSN = health-related social needs; CHW = community health worker; EF = ejection fraction; KCCQ = Kansas City Cardiomyopathy Questionnaire; HRRP = Hospital Readmissions Reduction Program. P1 to P6 refer to the framework propositions.

Figure 1: The Social Determinants and Transitional Care (SDTC) Framework.

Language and communication warrant specific attention in multilingual urban populations. Learner-specific barriers to second-language proficiency (Amessouwoe et al., 2024) and terminological difficulties in translating civil and administrative documents (Kpoka, 2024) mirror the challenges patients face with discharge paperwork, insurance forms, and benefit applications. Research on cross-cultural communication emphasizes the role of identity and diversity in how messages are received (Lilian et al., 2020), and studies of multilingual emergency communication show that accessibility and trust determine whether people act on information (Odejide, 2024), and work on technology integration for learners with disabilities treats accessibility as a core design requirement (Yeboah et al., 2024). Digital equity is also uneven, including among underrepresented learners in clinical training (Orise & Niniola, 2024a), which suggests similar gaps in patients' ability to use portals and telehealth.

Domain 2: SDOH-Informed Transitional Care

The second domain is the intervention bundle. It retains the core elements of evidence-based transitional care and reorganizes them around five components that make social risk an explicit target.

Screen

All patients admitted with HF receive standardized screening for health-related social needs within 48 hours of admission, using an instrument such as the Accountable Health Communities screening tool, which covers housing, food, transportation, utilities, and interpersonal safety (Billioux et al., 2017). Screening is supplemented by a brief health literacy item, preferred language, caregiver identification, and the Area Deprivation Index derived from the home address. Screening is performed with consent, explained in terms of help that can be offered, and documented in structured fields so it can drive downstream workflows.

Brief validated items are available for each domain, including the Hunger Vital Sign for food insecurity (Hager et al., 2010), a single item for health literacy (Chew et al., 2004), a three-item loneliness scale (Hughes et al., 2004), and the Neighborhood Atlas for linking addresses to the Area Deprivation Index (Kind & Buckingham, 2018). Because social needs data are sensitive, they should be held in architectures that comply with health privacy rules (Aliliele et al., 2024), protected through structured health data security frameworks (Nnaji & Akinlolu, 2024a), governed in line with harmonized data protection requirements (Annan, 2022; Ominyi & Anichukwueze, 2022), and secured with identity-centric access controls (Ogbole et al., 2021; Oshoba et al., 2019) under recognized cybersecurity governance frameworks (Jimoh et al., 2023).

Stratify

Patients are assigned a combined clinical and social risk tier. Clinical risk draws on established factors such as

prior hospitalization, renal function, and comorbidity burden; social risk counts unmet needs and their severity. Approaches that combine metabolic biomarkers with echocardiographic parameters (Okwah, 2022), biomarker-based translational decision support (Abdulrazaq et al., 2023), and AI-supported early detection of noncommunicable disease (Afrihyia et al., 2023) may refine clinical risk estimates over time, and predictive analytics built on real-world data can help hospitals calibrate tier thresholds to their local populations (Ilodigwe & Adesemoye, 2024a). Readmission risk models have historically shown only modest discrimination (Kansagara et al., 2011), which supports combining clinical scores with social risk rather than relying on either alone. AI-based risk stratification frameworks (Oparah, Ezeh, et al., 2021) and big data predictive models (Oparah et al., 2022) point to more adaptive approaches, provided they operate under clear governance and accountability (Afrihyia et al., 2024; Ominyi & Anichukwueze, 2024) and rest on interoperable, high-quality data infrastructure (Ilodigwe & Adesemoye, 2021). A simple three-tier approach is sufficient for practice: Tier 1 (standard transitional care), Tier 2 (enhanced, with CHW or navigator support), and Tier 3 (intensive, with home visits and multidisciplinary case review). Stratification allocates scarce safety-net resources where they are likely to have the greatest effect.

Tailor

The discharge plan is adapted to the needs identified. Medication regimens are reviewed for affordability, and patients leave with medications in hand through meds-to-beds programs or verified pharmacy fills. Hospital pharmacy models designed for equitable continuity of chronic therapies offer a practical template for this element (Asiedu & Asiedu, 2024a). Instructions are written in plain language and in the preferred language, with teach-back used to confirm understanding. Scales are provided to patients who lack them. Diet counseling reflects the foods actually available and culturally preferred. Follow-up appointments are scheduled at times and locations that the patient can reach, before the patient leaves the hospital, in line with the reengineered discharge principles of Project RED (Jack et al., 2009).

Medication reconciliation should include systematic screening for drug interactions, an approach developed for other clinical contexts (Asiedu, 2022). Early, structured up-titration of GDMT after discharge is safe and reduces death or readmission (Mebazaa et al., 2022), and both U.S. and European guidelines recommend multidisciplinary follow-up and self-care support for patients recently hospitalized for HF (Heidenreich et al., 2022; McDonagh et al., 2021).

Bridge

Bridging services span the hospital-to-home gap during the first 30 days. They include a CHW or patient navigator who meets the patient before discharge and maintains contact afterward, a post-discharge telephone call within 72 hours, a clinic visit within 7 days, home visits for Tier 3 patients, and structured telephone support or noninvasive telemonitoring where appropriate (Inglis et al., 2015). Mobile health tools for chronic disease monitoring and treatment adherence can extend these supports at scale when they are adapted to patients' literacy and connectivity (Oparah, Gado, et al., 2021). CHWs are central because they share lived experience with the communities served, build trust, and address practical barriers that clinicians often cannot (Kangovi et al., 2014).

Structured nursing communication pathways (Fapohunda et al., 2024) and policy-integrated nursing workflows (Omaghomi et al., 2024) show how standardized communication and workflow redesign support safe care across handoffs. Real-time health informatics can reduce decision delays (Nnaji & Akinlolu, 2022), analytics-driven performance models can address workflow inefficiencies (Nnaji & Akinlolu, 2023), and digital operations models can strengthen the flow of information between services (Nnaji & Akinlolu, 2024b). CHWs and navigators who support patients remotely also need digital documentation workflows that protect data integrity and HIPAA compliance (Peteranaba et al., 2023a), and the exchange of social needs information between hospitals and community organizations calls for clear governance of data verification, risk screening, and confidentiality (Peteranaba et al., 2022).

Link

Patients with identified needs receive closed-loop referrals to community-based organizations, such as medically tailored meals, housing assistance, transportation programs, utility assistance, and benefit enrollment. Closed-loop means that the referral is tracked until the organization confirms the service was delivered or the need was otherwise resolved. Linkage transforms screening from documentation into action and extends the reach of transitional care beyond what the hospital alone can provide. Customer relationship management and workflow automation platforms, already used to scale patient engagement in smaller practices, can supply the tracking and reminders that closed-loop referral requires (Eyetsemitan et al., 2024).

Localized supply and distribution models, including community-based logistics for regional resilience (Anene & Clement, 2024) and humanitarian supply chains that combine predictive analytics with local distribution (Anene & Clement, 2022), offer lessons for delivering meals, medications, and devices to patients' homes. Digital referral and engagement tools also carry financial and security risks, including cyber-enabled fraud in telemedicine (Ekechi et al., 2022) and the need to price and insure cyber risk on health technology platforms (Adebayo et al., 2023).

Table 1: SDTC Framework constructs, conceptual definitions, and example measures

Construct	*Conceptual definition*	*Example operational measures*
Economic stability	Capacity to afford medications, food consistent with a low-sodium diet, utilities, and copayments without trade-offs	AHC HRSN items; cost-related medication nonadherence; Hunger Vital Sign
Housing	Stable, safe housing with refrigeration and space to store medications and a scale	Homelessness or housing instability in past 12 months; utility shut-off threat
Transportation	Reliable means to reach pharmacy, clinic, cardiac rehabilitation, and laboratory visits	Missed appointments due to transportation; AHC transportation item
Health literacy and language	Ability to obtain, understand, and act on discharge instructions in the preferred language	Single Item Literacy Screener; preferred language; interpreter need
Social support	Availability of a person to help with daily weights, medications, and symptom escalation	Lives alone; caregiver identified; UCLA 3-item Loneliness Scale
Neighborhood disadvantage	Area-level deprivation that shapes food, safety, and service environments	Area Deprivation Index (ADI) national percentile by census block group
Screen	Systematic identification of health-related social needs during index admission	Proportion of HF admissions screened within 48 hours
Stratify	Assignment of combined clinical and social risk tier that sets transitional care intensity	Tier distribution; concordance of tier with services delivered
Tailor	Discharge plan adapted to identified needs, literacy, and language	Teach-back documented; medications in hand at discharge; plain-language plan
Bridge	Human and digital supports spanning hospital to home in the first 30 days	CHW contact within 72 hours; clinic visit within 7 days; home visit completed
Link	Closed-loop referral to community organizations with confirmation of service receipt	Referral closure rate; time to need resolution
Mechanisms	Proximal changes through which the bundle reduces readmission	Self-Care of Heart Failure Index; PDC for GDMT; need resolution
Outcomes	Clinical, patient-reported, equity, and economic end points	30-day all-cause and HF readmission; ED visits; KCCQ-12; equity gap; cost

Note. AHC HRSN = Accountable Health Communities Health-Related Social Needs screening tool; GDMT = guideline-directed medical therapy; PDC = proportion of days covered; KCCQ-12 = 12-item Kansas City Cardiomyopathy Questionnaire.

Domain 3: Mechanisms

The third domain specifies the mediating processes through which the bundle affects outcomes. Drawing on the theory of self-care, the first mechanism is improved self-care maintenance, monitoring, and management (Riegel et al., 2012). Additional mechanisms include medication adherence, particularly persistence with GDMT; timely outpatient follow-up; earlier recognition and reporting of congestion; reduction or resolution of social needs; and strengthened trust and continuity, which transitions theory identifies as process indicators of a healthy transition (Meleis et al., 2000). Specifying mechanisms allows evaluators to learn why an intervention worked or failed and to refine the components that matter most.

The central role of self-care is supported by an American Heart Association statement on promoting self-care in HF (Riegel et al., 2009) and by practical recommendations from the Heart Failure Association of the European Society of Cardiology (Jaarsma et al., 2021), and the revised Self-Care of Heart Failure Index provides a validated measure of this mechanism (Riegel et al., 2019). Trust may be especially important in communities that have experienced discrimination; research in other sectors shows that community trust helps determine whether infrastructure projects endure (Komi & Adeniji, 2024).

Domain 4: Outcomes

The primary outcome is 30-day all-cause readmission after HF hospitalization, with HF-specific readmission as a key secondary outcome. Because the HRRP has been associated with concerns about unintended consequences, including possible increases in mortality after HF hospitalization (Gupta et al., 2018), the framework also requires measurement of 30-day and 1-year mortality, emergency department revisits, and days alive and out of hospital. Patient-reported quality of life is measured with the Kansas City Cardiomyopathy Questionnaire. An equity outcome, defined as the difference in readmission rates

between patients with and without unmet social needs or across racial and ethnic groups, is tracked explicitly. Quality measurement frameworks that build equity into performance indicators, such as those proposed for HEDIS geriatric care measures, provide a template for this approach (Ekemezie et al., 2023a). Cost of care and return on investment complete the outcome set, which is essential for sustainability in safety-net budgets.

The KCCQ was validated as a health status measure for HF by Green et al. (2000), and its 12-item short form reduces respondent burden (Spertus & Jones, 2015). KPI-based accountability models used in long-term care (Ekemezie et al., 2023b) and performance intelligence models for public services (Adelanwa et al., 2024b) offer approaches for monitoring these outcomes routinely.

Context and Moderators

All domains operate within the context of the urban safety-net hospital, including its financial constraints, payer mix, staffing, information technology, HRRP exposure, community partnerships, and the state and federal policy environment. Clinical severity, including ejection fraction phenotype, comorbidity burden, and frailty, moderates the strength of the links between transitional care and outcomes. Patient preference and goals of care also moderate these links, because some patients with advanced HF may reasonably prioritize comfort and home over avoidance of hospitalization; for these patients, palliative care integration becomes the appropriate expression of the framework.

Table 1 summarizes the constructs, their conceptual definitions, and candidate operational measures.

Propositions

The relationships in the framework are stated as six propositions that can be tested empirically.

- *Proposition 1 (P1).* Among adults hospitalized with HF in urban safety-net hospitals, a greater number and severity of unmet social needs at admission is associated with higher 30-day readmission, independent of clinical risk.
- *Proposition 2 (P2).* Social determinants affect readmission partly through their effects on self-care, medication adherence, and timely follow-up; these mechanisms partially mediate the association described in P1.
- *Proposition 3 (P3).* An SDOH-informed transitional care bundle that includes all five components (Screen, Stratify, Tailor, Bridge, Link) reduces 30-day readmission more than standard transitional care, and the effect operates through improvement in the mechanisms in Domain 3.
- *Proposition 4 (P4).* The effect of the bundle is moderated by clinical severity and patient preference, with the largest absolute benefit expected among patients with high social risk and moderate clinical risk.
- *Proposition 5 (P5).* Closed-loop resolution of social needs is a stronger predictor of reduced readmission than screening alone; screening without linkage produces little or no benefit.
- *Proposition 6 (P6).* Routine equity-stratified audit and feedback of readmission outcomes, returned to the transitional care team, sustains improvement over time and narrows readmission gaps between socially advantaged and disadvantaged patients.

Application, Implementation, and Evaluation

Translating the Framework Into Practice

A safety-net hospital adopting the SDTC Framework would begin by embedding social needs screening into the nursing admission assessment with electronic health record prompts that trigger referral to social work or CHWs when needs are identified. An HF transitional care team, typically including an HF nurse navigator, a CHW, a pharmacist, and a social worker, would conduct a daily huddle to review new admissions, assign risk tiers, and plan discharge. Evidence that structured multidisciplinary collaboration improves patient outcomes in acute care settings supports this team-based design (Ohunyon et al., 2023). A meds-to-beds pharmacy service and a standing bank of scales and pill organizers would support the Tailor component. A protected block of 7-day post-discharge appointments in an HF or primary care clinic, with transportation vouchers or rideshare benefits, would support the Bridge component. Formal agreements with community organizations and a referral platform capable of closed-loop tracking would support the Link component.

Consider a 58-year-old Spanish-speaking man admitted with acute decompensated HF with reduced ejection fraction. Screening reveals food insecurity, no scale at home, and no transportation. He is assigned to Tier 2. Before discharge, he receives his medications, including GDMT, from the hospital pharmacy with copay assistance; a scale; Spanish-language instructions confirmed by teach-back with his daughter present; and a clinic appointment on day 5 with a scheduled ride. A CHW visits him on day 3, helps enroll him in a medically tailored meal program, and confirms he is weighing himself daily. When his weight rises on day 12, he calls the HF nurse line rather than waiting, and a diuretic adjustment avoids readmission. Each step in this sequence corresponds to a framework component and a hypothesized mechanism.

Implementation Considerations

Implementation in resource-constrained settings is a central concern. The Consolidated Framework for Implementation Research can guide assessment of barriers and facilitators across intervention characteristics, inner and outer settings, individuals, and process (Damschroder et al., 2009). Common barriers include staff time for screening, CHW workforce sustainability, limited

community resource capacity, and data systems that do not support closed-loop referral. Facilitators include alignment with CMS social driver reporting requirements, the cost of HRRP penalties, Medicaid waivers that fund health-related social needs services in several states, and institutional equity commitments. Stratification itself is an implementation strategy, because it focuses the most intensive and expensive services on the patients most likely to benefit.

Implementation strategies can be selected from the Expert Recommendations for Implementing Change compilation (Powell et al., 2015), and implementation outcomes such as acceptability, adoption, fidelity, and sustainability should be measured alongside clinical outcomes (Proctor et al., 2011). Experience from other sectors offers practical tools: standard operating procedures can serve as change infrastructure (Agboada et al., 2019) within a broader digital transformation of operations (Agboada et al., 2018); Lean Six Sigma can be adapted for resource-constrained organizations (Ambali et al., 2021); lean change adoption frameworks guide digital transformation (Eyetsemitan et al., 2023); standardized reporting workflows improve data quality (Alieme et al., 2022); workflow redesign reduces bottlenecks (Nwangwu et al., 2024); and multisite performance indicators support coordination across units (Akin-Oluyomi & Akhigbe, 2023). Program management models for coordinated multisite health care expansion apply when a system scales the bundle across hospitals (Aminu-Ibrahim et al., 2021).

Workforce issues are central to implementation. Frameworks for managing staffing volatility (Falemi et al., 2023b), linking retention systems to productivity (Falemi et al., 2023a), and preparing employees for technology adoption (Akhigbe et al., 2024) apply directly to building and keeping a CHW and navigator workforce. Training for this workforce can draw on data-informed digital learning platforms for health and STEM education (Orise & Niniola, 2020), real-time performance dashboards in health professional training (Orise & Niniola, 2022), learning analytics in clinical education (Orise & Niniola, 2024b), and ethical data practices in health education technology (Orise & Niniola, 2023). Structured supervision models that improve the preparedness of early-career clinicians in low-resource hospitals (Peteranaba et al., 2023b) suggest how new transitional care staff can be onboarded safely.

Evaluation

The RE-AIM framework (Glasgow et al., 1999) offers a practical structure for evaluation: Reach (proportion of eligible HF patients screened and enrolled), Effectiveness (readmission, mortality, quality of life, equity gap), Adoption (proportion of units and clinicians using the bundle), Implementation (fidelity to each component, such as the proportion of referrals closed), and Maintenance (persistence of effects and practices at 12 months and beyond). Designs suited to safety-net settings include stepped-wedge cluster trials across units or hospitals, interrupted time series using administrative data, and pragmatic randomized trials. Mediation analysis should be used to test P2 and P3, and interaction terms or stratified analyses to test P4. Public health informatics frameworks that use disaggregated data to protect vulnerable populations can guide the equity-stratified dashboards needed to test P6 (Anioke & Atima, 2023c). Patient and community partners should participate in selecting outcomes and interpreting findings.

Stepped-wedge cluster randomized designs suit staged rollout across units (Hemming et al., 2015), and segmented regression offers a rigorous approach to interrupted time series analysis (Wagner et al., 2002). Performance dashboards support leadership visibility (Ezeako et al., 2024), and public health dashboards (Oparah et al., 2023), assessments of surveillance data quality (Ekemezie et al., 2018), data-driven surveillance systems (Ogunboye et al., 2023), process-based governance models (Anioke & Atima, 2023b), and business intelligence for resource allocation and program accountability (Anioke & Atima, 2023a; Owoade et al., 2022) provide models for monitoring and accountability. AI-supported decision tools for health care operations and resource planning may help managers allocate CHW and nursing capacity across tiers (Adelanwa et al., 2024a). Economic evaluation should also account for the cost of protecting patient data, since cybersecurity investments affect the financial performance of health care organizations (Ozowara et al., 2022).

Discussion and Implications

The SDTC Framework brings together two bodies of evidence that have largely developed in parallel: research on transitional care for HF and research on social determinants and social needs interventions. Placing them within one structure clarifies where social risk enters the pathway to readmission, where transitional care can intervene, and which intermediate changes should be observed if an intervention is working. Consistent with prior statements from the American Heart Association (Albert et al., 2015; White-Williams et al., 2020), the framework treats transitional care and social care as complementary parts of the same clinical responsibility. The implications differ for clinicians, policymakers, and researchers, and the framework has limitations that shape how it should be used.

Implications for Nursing and Clinical Practice

The framework positions nurses as central agents of the transition. Nurses perform admission assessments in which social needs are identified, deliver discharge teaching, coordinate with CHWs and social workers, and often staff post-discharge telephone follow-up. The framework encourages nurses to treat social needs as clinical information that changes the plan of care, in the

same way that a low potassium level or a new arrhythmia would. It also highlights the need for training in trauma-informed and culturally responsive communication, teach-back, and motivational approaches to self-care. Integrative cognitive-behavioral and dialectical behavior therapy approaches to trauma and behavioral dysregulation (Eribenne et al., 2024) and mindfulness-based interventions for stress reduction (Osinem et al., 2023) can inform how teams respond to the psychological distress that often accompanies HF and social adversity.

Implications for Policy

The framework supports policy that funds social needs interventions as part of HF care. Relevant levers include Medicaid coverage of CHW services and health-related social needs supports, CMS reimbursement for transitional care management and community health integration services, and continued refinement of social risk adjustment in value-based programs so that safety-net hospitals are not penalized for serving disadvantaged populations. The framework also suggests that policy should reward reductions in readmission disparities, not only overall rates.

Implications for Research

Each proposition is designed for empirical testing. Priority questions include which social needs are most strongly linked to readmission in specific safety-net populations, which components of the bundle carry the most effect, what level of CHW intensity is cost-effective, and whether reductions in readmission are accompanied by stable or improved mortality. Research should report outcomes stratified by race, ethnicity, language, and social risk to assess whether the framework narrows inequities. Qualitative and mixed-methods studies are needed to understand how patients experience screening and referral and how trust develops across the transition.

Limitations

Several limitations should be acknowledged. The SDTC Framework is conceptual and has not yet been tested as an integrated whole; its propositions are derived from evidence on individual components and associations rather than from a single study. Social needs screening may be underreported when patients fear stigma or immigration consequences, and screening tools vary in validity across populations. Community resource capacity is uneven, so linkage may fail even when screening and referral are performed well. The framework focuses on the 30-day window emphasized by current policy, yet some social interventions may produce benefits over longer horizons. Risk algorithms used for stratification may also encode existing inequities, as research in other sectors has shown that accurate forecasts are not necessarily fair across districts (Komi, 2023). Finally, structural determinants such as housing markets and wage policy lie largely outside the reach of hospital-based programs, so the framework should be viewed as one part of broader efforts to advance health equity rather than a complete solution.

Conclusion

Heart failure readmissions in urban safety-net hospitals arise where a demanding chronic illness, a vulnerable transition period, and adverse social conditions meet. This paper presented the Social Determinants and Transitional Care Framework, which explains how unmet social needs raise readmission risk, specifies how transitional care can be redesigned to address those needs, and identifies the intermediate changes through which benefit should occur. Its five components (Screen, Stratify, Tailor, Bridge, and Link) give hospitals a practical sequence for turning social needs screening into action, and its propositions and measures give researchers a clear basis for testing whether the approach works and for whom. Treating equity as a measured outcome keeps attention on whether gaps between patients narrow, not only on whether average readmission rates fall. Testing the framework in safety-net settings is the necessary next step toward care transitions that reduce readmissions and improve the lives of patients with heart failure in the communities that need it most.

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