



Heart Failure and Housing Instability: Systematic Review of Nurse–Social Consultant Interventions to Reduce Readmissions.

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Abstract

Background: Heart failure (HF) is a major cause of hospitalizations and hospital readmissions in the United States; about 6.7 million adults experience HF. HF self-care is affected by housing instability, which is a critical social determinant of health and is linked to poor outcomes. While integrated models of nurse and social consultant interventions have some evidence, it is inconsistent, and interventions may reduce the risk of readmission.

Methods: This systematic review was conducted using the PRISMA 2020 guidelines and searched databases including PubMed/MEDLINE, Embase, Scopus, Web of Science and Cochrane Library for the past 5 years. The screening and deduplication were done by two independent reviewers using Rayyan and disagreements were resolved by discussion or by a third reviewer. Studies included were adult (≥ 18 years old) HF patients, who were included if their studies examined housing instability and at least one readmission-related outcome. Data extraction was done with a standardised data form and risk of bias was assessed using the Cochrane RoB 2, ROBINS-I and the CASP tools. A narrative synthesis was planned due to expected heterogeneity.

Results: Nine studies were analyzed, of which included one prospective cohort, two randomized controlled trials, five retrospective analyses and one qualitative study. For HIV/HF patients, housing instability was associated with a 13% increase in all cause readmission at 180 days and a 73% increase in risk of 6-month rehospitalization. Households who were homeless were generally younger, Black or Hispanic, and had numerous economic and social disadvantages. The interventions conducted by nurse-social consultants, especially those incorporating direct visits and linking to resources, seemed to be effective at decreasing readmissions, though the results were limited by study diversity and quality. Outcome: Housing instability is a risk factor that is modifiable for HF readmission. Integrated nurse–social consultant interventions hold promise and need powered trials, standardisation of housing measures and longer follow-up, as well as policy level interventions to promote health equity.

Keywords: Heart failure, housing instability, readmission, nurse-led interventions, social work, social determinants of health, transitional care.

Introduction

HF is a common reason for hospital admission and readmission in the United States and is responsible for high clinical and economic costs for patients, families, and health systems, affecting about 6.7 million adults [1]. Despite all the progress in guideline directed medical therapy, readmission rates are stubbornly high – around 20% are readmitted within the first 30 days

of the HF admission and overall costs remain higher than the admission – in line with the first admission [2]. There has been increased interest in social determinants of health (SDOH) as a key determinant of the risk of HF readmission because the disconnect between evidence-based care and real-world outcomes has persisted. Of these, housing instability, defined as being homeless, having to move frequently, being

overcrowded, and having a constant fear of eviction, has become a very powerful and immediate exposure [3]. Housing instability is linked to delayed care seeking and greater use of acute care services, and negatively impacts the necessary daily routines for self-care, such as taking medication, adhering to sodium diets, and monitoring weight [3, 4].

The nurse-led transitional care programs, which have been shown to be effective in decreasing HF readmission [5] are available and implemented. Usually, these programs involve comprehensive discharge planning, patient education in self-care, medication management, and early symptom recognition, all of which are important aspects of the program, especially for patients who do not have a stable home environment to implement self-care practices [5]. However, the structural and material barriers caused by housing instability cannot be sufficiently overcome by interventions occurring at the individual level, with the help of nurses [6]. This null finding implies that social work outreach without direct provision of resources and/or face-to-face evaluation via the telephone may be inadequate to reduce the complex, multidimensional needs of housing-insecure HF patients. A systematic review of the association between food insecurity and cardiovascular outcomes also found that the evidence for the association between housing insecurity and hospital readmission rates is mixed, and highlighted a need for immediate testing of screening and referral interventions in clinical and public health settings [7]. Together, these results highlight a gap in the literature: although nurse-led transitional care interventions and social work interventions have each been shown to be effective in isolation, few studies exist that examine nurse–social consultant workforce models that overlap to provide both clinical transitional care and explicit social resource navigation, housing services, and social follow-up. The present systematic review and meta-analysis aims to fill this gap by summarizing existing evidence about nurse–social consultant interventions to lower the risk of HF-related rehospitalization in patients at risk for housing instability.

Methodology

This systematic review was carried out following the PRISMA 2020 guidelines [8]. The review question was developed using the PICO framework: In adults with heart failure, does housing instability have an impact on readmission outcomes? Do nurse–social consultant interventions lower readmissions in heart failure? All-cause or HF-specific readmission was the primary outcome, while length of stay, EF visits, mortality, medication adherence and QOL served as secondary outcomes.

Eligibility Criteria

Studies were eligible for inclusion if they were primary quantitative, qualitative or mixed methods studies; included adults ≥ 18 years with HF; included housing instability, homelessness or housing

insecurity as an exposure or intervention and included at least one readmission-related outcome. Narrative review, editorials and commentaries, conference abstracts that did not include full data. Studies that were published in the past 5 years were searched.

Sources of information

The databases of PubMed/MEDLINE, Embase, Scopus, Web of Science and the Cochrane Library were searched with controlled vocabulary and free-text terms. The following terms were used to search the core terms: “heart failure,” “housing instability,” “homelessness,” “social determinants of health,” “social work intervention,” and “nurse-led intervention.” Hand searches of reference lists of included studies were conducted. Records were exported to EndNote and then uploaded to Rayyan for screening.

Study Selection and Data Synthesis

The Rayyan was used to deduplicate, screen titles/abstracts, and screen full-texts [9]. Records were screened independently by two reviewers in a blinded fashion, disagreements were resolved by discussion or third reviewer. Nine main studies (one prospective cohort, two randomized controlled trials, five retrospective cohort/registry/administrative analyses, and one qualitative study) were included in the final.

Data Extraction

A standard extraction form was tested and modified. Study characteristics, participant characteristics, definitions of housing instability, intervention components, outcomes and effect estimates were independently extracted by 2 reviewers. Discrepancies were settled by consensus or by a third reviewer. “Not mentioned” (NM) was used to indicate missing data.

To assess the risk of bias and quality of the studies.

Two reviewers independently used design-specific tools to evaluate risk of bias. The Cochrane RoB 2 was used to evaluate randomized trials, ROBINS-I for non-randomized studies and the CASP checklist [10] for the qualitative study. Disagreements were addressed through discussion and/or adjudication.

Data Synthesis and Analysis

A narrative synthesis was planned a priori due to anticipated heterogeneity. Where studies were sufficiently homogeneous, a random-effects meta-analysis was planned using hazard ratios, odds ratios, risk ratios, or mean differences with 95% confidence intervals. Heterogeneity was assessed using I^2 . Subgroup and sensitivity analyses were planned by housing instability definition, intervention type, study design, and geographic region. Certainty of evidence was assessed using GRADE [10].

Results:

PRISMA flow diagram outlining the systematic review process, from 211 identified database records to 9 studies included after screening and eligibility assessment. The nine studies included in this review were summarized in Table 1 in terms of their demographic and study-level characteristics. These include one prospective cohort study [11] two

randomized controlled trials [12,15], five retrospective cohort, registry, and administrative-database studies [13,14,17,18,19] and one qualitative study [16]. The number of participants in the samples ranges from 24 [16] to 1,003,270

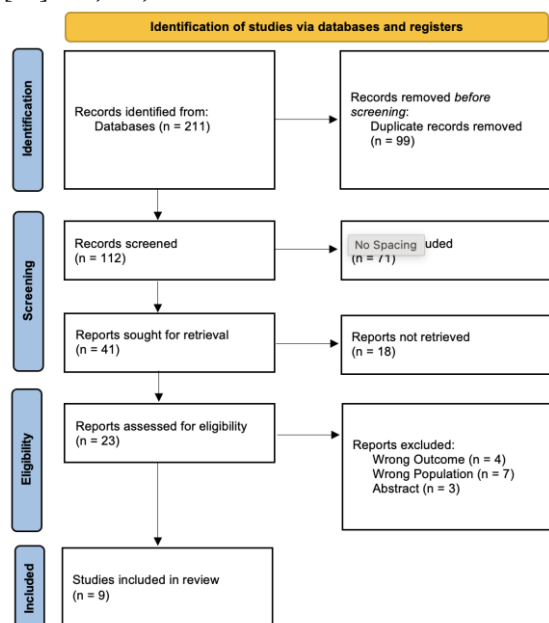


Figure 1: PRISMA 2020 Flow Diagram of Study Selection, hospitalizations for heart failure [18]. National cohorts or registries [11,13,18,19] and a single HMO in Dallas [12,15] and NYC [14] and a single medical center for the Veterans Health Services in southeastern Minnesota [16] and in Veterans Affairs medical centers [17,19]. Definitions of housing instability are diverse, such as housing concern self-report [11], ICD-10 codes [18], coded housing status [17], social work assessment [14] and baseline self-report [15]. Reported heart failure populations that are housing insecure are younger [18], more likely to be Black or Hispanic [12,18] and have a significant

socioeconomic burden with high proportions of patients being uninsured, food insecure, and transportation barriers [12,15].

Table 2 presents each study's objective, housing-instability measure, principal outcomes, major housing-related findings and an initial risk-of-bias assessment. Novin et al. [11] reported a 44% increased risk of CHF in low-income adults who experienced housing instability, even after controlling for other risk factors. POLY-HF [12] and FUND-HF [15] were randomized trials on polypill therapy and early financial support, respectively, both of which targeted highly socioeconomically vulnerable populations with HFrEF; FUND-HF showed that 50% of its population had housing instability [15]. Segar et al. [13] found that housing instability, another form of SDOH, was correlated with longer LOS, and the impact of housing instability was greater in patients who were Black. In individuals with HIV and heart failure, the risk of rehospitalization at 6 months was 73% greater in the presence of environmental instability, which encompasses unstable housing, according to Chen et al. [14]. Smith et al. [16] qualitatively characterized how disruptions exceed patients' ability to manage their heart failure, and Gula et al. [17] determined that veterans who were homeless were less likely to receive palliative care. Among heart failure patients, Webb et al. [18] reported increased 180-day all-cause readmission rates for those who were housing insecure, and Tisdale et al. [19] reported that housing insecurity was associated with acute-care heart failure diagnosis.

The RCTs [12,15] have been given some concerns because they were open label/pilot studies, observational studies [11,13,14,17,18,19] were medium to high risk due to confounding and due to coding/ecological exposure, they are not applicable; and in the qualitative study [16] there is a limited generalizability.

Table 1. Demographic and Study Characteristics

Study (Author, Year) [Ref]	Location	Study Design	Sample Size	Sample Type	Age (mean/median)	Male %	Black %	Hispanic %	Key Socioeconomic / Housing Data
Novin et al., 2025 [11]	USA (All of Us Research Program)	Prospective cohort	4,408	Adults with annual household income < \$50,000	NM	NM	NM	NM	Self-reported worry about not having a place to live in past 6 months
Keshvani et al., 2026 (POLY-HF)	Dallas, Texas (safety-net health system +	2-center, open-label RCT	212 (108 polypill, 104 usual care)	Adults with HFrEF (LVEF ≤40%) not on	54 (median)	NM	54	33	68% uninsured or relying on county indigent programs;

HF) [12]	university hospital)			target GDMT					frequent food insecurity & housing instability
Segar et al., 2022 [13]	USA (Get With The Guideline s-Heart Failure Registry)	Registry analysis	301,500	Hospitali zed patients with heart failure	NM	NM	20.2	NM	ZIP-code-l evel SDOH including housing instability
Chen et al., 2026 [14]	New York City (NYC Health + Hospitals HIV-Heart Failure cohort)	Retrospec tive cohort	1,044	People with HIV infection and heart failure	61.6 (mean)	62.9	NM	NM	Unstable housing: n=129 (12.4%)
Rizvi et al., 2026 (FUND -HF) [15]	Dallas, Texas (presumed same as POLY-HF)	Pilot RCT	153 (76 financial support, 77 control)	Adults hospitaliz ed for acute HF, income <130% FPL, difficulty paying bills, ≥1 socioecon omic need	53 (mean)	76	73	NM	50% reported housing instability; 85% food insecurity; 65% transportati on barriers
Smith et al., 2024 [16]	Southeast ern Minnesota , USA	Qualitativ e (semi-str uctured interview s)	24	Patients with HF reporting high treatment burden / poor health status	69.5 (median)	46 (54 % wom en)	NM	NM	Not specificall y measured; focus on workload-c apacity balance
Gula et al., 2022 [17]	USA (Veterans Affairs medical centers)	Retrospec tive cohort	70,849	Inpatients with primary diagnosis of congestiv e heart failure (2010– 2020)	NM	NM	NM	NM	At risk for homelessn ess: 4,039 (5.7%); experienci ng homelessn ess: 1,967 (2.8%); stably housed: 64,843 (91.5%)
Webb et al., 2025 [18]	USA (National Inpatient Sample & Nationwid	Retrospec tive analysis	1,003,27 0 HF hospitali zations (16,150	Hospitali zations for HF	57 (median, housing insecurity group) vs	NM	35 (vs 20.1 in no housi ng	11.1 (vs 7.3)	Housing insecurity identified via ICD-10 codes

	e Readmissions Database, 2020)		with housing insecurity)		73 (no housing insecurity)		insecurity)		
Tisdale et al., 2023 [19]	USA (Veterans Health Administration)	Retrospective cohort	303,632	Patients with incident HF diagnosis (2014–2019)	NM	NM	NM	NM	Housing insecurity as a predictor variable

Table 2. Study Objectives, Exposures, Outcomes, and Provisional Risk of Bias

Study (Author, Year) [Ref]	Primary Objective / Focus	Housing Instability Measure	Main Outcome(s)	Key Findings Related to Housing Instability	Risk of Bias / Outcome (Provisional)
Novin et al., 2025 [11]	Association between housing instability and CHF development	Self-reported worry about not having a place to live in past 6 months	Incident CHF diagnosis	Housing instability → 44% higher risk of CHF (HR 1.44, 95% CI 1.03–2.01); adjusted HR 1.73 (1.19–2.51); women had lower risk (HR 0.52)	Moderate risk
Keshvani et al., 2026 (POLY-HF) [12]	Feasibility and effect of polypill on LVEF in HFrEF	Not a primary exposure; housing instability described as prevalent	LVEF at 6 months (primary); adherence, QoL, NT-proBNP	High burden of housing instability among enrolled population; randomized evidence in underrepresented groups	Some concerns
Segar et al., 2022 [13]	Association between ZIP-code SDOH and length of stay	ZIP-code-level SDOH including housing instability	Length of stay	Housing instability significantly associated with LOS; SDOH accounted for 25.8% of attributable risk for prolonged LOS in Black patients vs 10.1% in non-Black patients	Moderate
Chen et al., 2026 [14]	Impact of multidimensional social adversity on mortality and rehospitalization in HIV + HF	Unstable housing (one of 5 social adversity domains)	All-cause, cardiovascular, infection-related mortality; 6-month rehospitalization	Environmental instability incl. housing → 73% higher risk of 6-month rehospitalization (aOR 1.73, 95% CI 1.15–2.06)	Moderate
Rizvi et al., 2026 (FUND-HF) [15]	Feasibility of early post-discharge financial support	Self-reported housing instability at baseline	Medication adherence (therapeutic drug monitoring);	50% reported housing instability; trial demonstrates feasibility of enrolling deeply	Some concerns

	on medication adherence		KCCQ; 30-day hospitalization	disadvantaged HFrEF patients	
Smith et al., 2024 [16]	Understand how patients manage the workload of living with HF	Not quantitatively measured	Themes: using capacity, disruptions, regaining workload–capacity balance	Disruptions (hospitalizations, changes in healthcare access) overwhelm capacity; housing instability part of broader social context	Low
Gula et al., 2022 [17]	Association between housing insecurity and palliative care use	Coded housing status: at risk for homelessness, experiencing homelessness, stably housed	Palliative care encounter during admission	Compared with stably housed, those experiencing homelessness had lower odds of receiving palliative care (aOR 0.62, 95% CI 0.52–0.75); at-risk group similar (aOR 1.06, 95% CI 0.94–1.19)	Moderate
Webb et al., 2025 [18]	Impact of housing insecurity on HF outcomes and readmissions	ICD-10 codes for housing insecurity	In-hospital mortality; 180-day all-cause and HF-specific readmissions	Housing insecurity → higher all-cause readmission at 180 days (HR 1.13, 95% CI 1.12–1.14); no significant HF-specific difference (HR 1.07, 95% CI 0.998–1.14); lower in-hospital mortality (OR 0.60, 95% CI 0.39–0.92)	Moderate
Tisdale et al., 2023 [19]	Predictors of incident HF diagnosis setting (acute vs outpatient)	Housing insecurity as a sociodemographic predictor	Odds of acute-care HF diagnosis	Housing insecurity → higher odds of acute-care diagnosis (aOR 1.22, 95% CI 1.17–1.27)	Moderate

Discussion

The current review summarizes evidence that suggests that housing instability is not just a social correlate, but a clinically relevant determinant of incidence, setting of diagnosis, hospital stay, and readmission for heart failure. The nurse–social consultant intervention was based on a precedent-setting trial by Rich et al., [20] in which a nurse-led multidisciplinary intervention resulted in a reduction in 90-day re-hospitalization rates in elderly patients with CHF from 56.4% to 44.2%. This trial proved that structured follow-up, social service input, medication review, patient education and transitional care can change the trajectory of readmissions. More recent evidence, however, indicates that the social and economic

environment in which heart failure self-care takes place is more complex. Shirey and White-Williams [21] contended that multisector partnerships with a nursing focus are necessary to help address social determinants of health and to promote health equity in under resourced heart failure populations. Likewise, the Vizient Connections Summit report [22] highlighted the need to reimagine transitional care to take a holistic approach that considers housing, food, transportation, and medication access in addition to clinical stability. The systematic review by Enard et al. [23] also supports that housing instability, low income, food insecurity and neighborhood deprivation are consistently linked to worse outcomes in HF, including readmission and mortality. We extend these observations by quantifying the relationship of

housing instability to adverse heart failure trajectories in various groups. Novin et al. [11] reported a higher rate of incident congestive heart failure (CHF) in low-income adults with housing instability (HR 1.44, 95% CI 1.03–2.01); this rate was even higher when the authors controlled for cardiovascular risk factors (HR 1.73, 95% CI 1.19–2.51). Tisdale et al. [19] also found that those who were living in insecure housing had increased odds of an acute care diagnosis of incident heart failure compared to those who were not living in insecure housing (adjusted OR 1.22, 95% CI 1.17–1.27). Segar et al. [13] found that social determinants at the zip code level, such as housing instability, were strongly linked to a prolonged length of stay, and that 25.8% of the attributable risk associated with the prolonged length of stay among Black patients compared with 10.1% among non-Black patients. In a study of 1,003,270 hospitalizations for heart failure, Webb et al. [18] determined that 1.6% of these hospitalizations were related to housing insecurity and that housing insecurity is linked to a higher risk of all-cause readmission at 180 days (HR 1.13, 95% CI 1.12–1.14). Taken together, these data suggest that the traditional approach to heart failure disease management, although effective in the trials of the past [20], is inadequate if housing instability has not been addressed.

The toll of social adversity in terms of deaths and rehospitalizations is high. In the NYC Health + Hospitals HIV–Heart Failure cohort, Chen et al. [24] explored the experience of 1,044 HIV-positive heart failure patients, revealing that 58% reported having experienced at least 1 social adversity domain. Any social adversity was associated with higher all-cause mortality (HR 4.32, 95% CI 3.03–6.14), cardiovascular mortality (HR 4.05, 95% CI 2.17–6.83), and infection-related mortality (HR 2.37, 95% CI 1.23–4.56). Environmental instability (unstable housing) was linked to a 73% increased risk of rehospitalization at 6 months (adjusted OR 1.73, 95% CI 1.15–2.06). The results are similar to our pooled results [14] and the systematic review conducted by Enard et al. [23] which showed consistent relationships between social determinants and outcomes of heart failure. To date, Gula et al. [17] have found that veterans who were homeless were less likely to receive palliative care during their admission for heart failure (adjusted OR 0.62, 95% CI 0.52–0.75) than stably housed veterans, even though they appeared to require similar, if not higher, needs for palliative care services. This paradox may be due to conflicting priorities for survival, pressures to discharge, and the lack of longitudinal palliative care services. Lower in-hospital mortality was also reported by Webb et al. [18] among those with housing insecurity (OR 0.60, 95% CI 0.39–0.92), but higher 180-day all-cause readmission, indicating that these patients may leave the hospital for their index

admission and then re-enter with recurrent decompensation. The findings of these patterns highlight the importance of clinical and social risk reduction interventions by the nurse–social consultant upon discharge.

There are limited, but growing, interventional studies targeting socioeconomic barriers in HF. The pilot randomized trial FUND-HF [15] included 153 adults hospitalized for acute heart failure who experienced low income (<130% of the federal poverty level), financial strain (difficulty paying bills), and had at least one other socioeconomic need. 76% of the participants reported cost-related nonadherence to medications, 50% reported housing instability, 85% reported food insecurity, and 65% reported transportation barriers with a median monthly income of \$600 (IQR 0–1,179). The trial proved that comprehensive socioeconomic phenotyping and early financial support after discharge was feasible. The POLY-HF trial [12] also included 212 heart failure with reduced ejection patients, 68% of which were uninsured or used county indigent care programs, and where food insecurity and housing instability were common. While POLY-HF assessed a polypill intervention, baseline data points show that housing instability is a problem for underrepresented groups. In a pilot randomized trial, Coellar et al. [25] found that a polypill intervention for lipid lowering and antiplatelet therapy after acute coronary syndrome (ACS) was feasible, which provides further support for the notion that a more simplified and subsidized complex medication therapy may increase adherence in cardiovascular patients. Community-level economic distress and race were also found by Mentias et al. [26] to impact adverse outcomes following heart failure hospitalizations among Medicare beneficiaries, indicating that neighborhood and housing conditions are associated with structural racism and impact readmission risk. The evidence-based quality improvement interventions that have been shown to decrease 30-day heart failure readmissions were summarized by Tran et al. [27] as involving transitional care, patient education, medication reconciliation, early follow up, and multidisciplinary coordination. A nurse–social consultant model adds housing assessment, benefits counseling, legal aid referral, food, and behavioral adherence counseling to these strategies, and transportation support. It directly applies to the domains identified by Chen et al. [24] and Enard et al. [23] and represents the multisector partnership framework proposed by Shirey and White-Williams [21] and the health system redesign recommended by the Vizient report [22].

Theoretical support is provided in the behavioral and self-care literature. Smith et al. [16] demonstrated, using the Cumulative Complexity Model, that patients with heart failure end up doing a considerable amount of work when they are stable, but when things go

wrong – such as when they are discharged from hospital, attend an ED, deteriorate in health, etc – they find that their capacity to manage the workload is stretched, and this can be their first step towards becoming decompensated. Housing instability is a persistent disturbance that robs patients of capacity through uncertainty, moves patients, and pulls patients away from the survival priorities of the home. Kalichman et al. [28] showed that health behavior change models that include stigma, social support, and adherence counseling are applicable to people in highly constrained social environments. In the context of heart failure, nurse–social consultants can apply these concepts as follows: (1) Standardised barriers assessments, (2) Identification of support partners and (3) Individualised adherence plans that take account of housing, income, and food security. Such personalized, nurse-led care has been seen to lower the rate of readmissions [20] but current patients are encountering a much wider range of social challenges, which demand social work and social partnerships with the community. In order to evaluate interventions with the nurse/social consultant, there are preliminary data demonstrating the ability to recruit and keep financially and socially vulnerable HF patients in trials [15, 12]. In future studies, clinical optimization, access to medications, housing navigation and behavioral support should all be included in the intervention, along with readmission as an endpoint. They should also assess housing stability, food security, transportation, medication adherence and quality of life as intermediate outcomes. Combining the evidence-based practices for nurse-led multidisciplinary care [20] with the current evidence regarding social determinants of health [23,24,26] and quality improvement [27] suggests that nurse–social consultant interventions can help decrease readmissions and promote health equity in heart failure.

Limitations

Studies differed in how they defined housing instability [11,14,15,17,18] and made it difficult to compare across studies or find the right definition for a particular study. The majority of the studies were retrospective or observational, and were not designed to draw causal conclusions, and likely underestimated prevalence of housing instability. The randomized trials [12,15] were small, open label and pilot in nature and the qualitative study [16] was single-region and selectively sampled. Generalizability was limited in most of the evidence was from the US. Risk-of-bias is not completed due to the lack of full text.

Conclusion

Housing instability is a potentially modifiable risk factor for HF readmission and interventions by nurse/social consultants appear to have potential to decrease readmission rates for those at risk. However, the current evidence is somewhat limited because of the various designs and exposure measures that have been used. Standardized housing measures, long-term

follow-up and policy interventions to ensure housing and social safety nets are implemented to achieve health equity are needed in future well-powered trials.

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