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IMPACT OF MULTIDISCIPLINARY CARE ON PATIENT OUTCOMES: A SYSTEMATIC REVIEW

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Abstract

Background: Multidisciplinary care (MDC) models, such as stroke units, heart failure clinics, and integrated diabetes teams, are promoted to improve outcomes through coordinated, protocol-driven, team-based care. We systematically reviewed original studies evaluating MDC versus usual care and synthesized contemporary reviews to contextualize effects across conditions. Methods: Following PRISMA guidance, we searched and analyzed seven included studies supplied by the requester, spanning randomized trials and comparative cohorts in heart failure, stroke, and type 2 diabetes. Primary outcomes included mortality, hospitalization/readmission, functional status/quality of life, and cardiometabolic control. Data were extracted into structured tables and narratively synthesized. Results: In heart failure, two randomized trials showed fewer readmissions and improved quality of life and therapy optimization with MDC, with neutral short-term mortality effects. In stroke, specialized stroke units consistently reduced length of stay and showed absolute reductions in in-hospital case fatality in some settings; recent real-world data reported shorter stays without mortality change. In diabetes, a recent randomized trial and a real-world comparative study found improved HbA1c, lipids, treatment processes, and quality of life with multidisciplinary programs. Across studies, benefits clustered around utilization, risk-factor control, adherence, and patient-reported outcomes; mortality effects were mixed over short follow-up. Conclusions: MDC improves key process and patient outcomes across conditions, especially readmissions, length of stay, quality of life, and cardiometabolic control; survival benefits vary by context and time horizon. Implementation fidelity and team composition likely modulate effect sizes. Further pragmatic trials with longer follow-up are warranted.

Keywords: Multidisciplinary Care; Stroke Unit; Heart Failure Clinic; Diabetes Team; Readmission; Length of Stay; HbA1c; Quality of Life; PRISMA.

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INTRODUCTION

Multidisciplinary care (MDC) organizes delivery around coordinated teams with complementary expertise, standardized protocols, and regular case review. In acute stroke, organized stroke units—staffed by nurses, physicians, and therapists working as a focused team—have been shown to increase the likelihood of survival, independence, and living at home at one year compared with general wards (Stroke Unit Trialists' Collaboration 2013).

Subsequent analyses reinforce benefits beyond statistical significance, emphasizing reductions in dependency and institutionalization and shorter inpatient stays (Sun et al. 2013).

Similar principles underlie hospital-based teams more broadly: cohesive, protocol-driven teamwork improves communication, reduces adverse events, and shortens length of stay while enhancing patient and staff satisfaction (Epstein 2014). In oncology, multidisciplinary tumor boards were widely adopted to promote evidence-based, coordinated decisions; while early evidence about their direct impact on survival was mixed, the rationale centers on correctness of staging and treatment planning in complex cases (Patkar et al. 2011). In primary care for diabetes, team-based models that integrate physicians, nurses, pharmacists, educators, and allied professionals have demonstrated improvements in blood pressure, lipids, and glycemic control, particularly when interventions combine pharmacologic management with behavioral support and mixed in-person/remote follow-up (Tu et al. 2024).

Despite wide endorsement, the magnitude and consistency of MDC effects vary by condition, setting, and outcome. Mortality gains can be modest or require longer follow-up, whereas process measures, risk-factor control, and utilization (readmissions, length of stay) tend to improve more reliably. Heterogeneity in team composition, integration, and implementation fidelity likely explains differences across studies.

This systematic review focuses on original comparative studies in heart failure, stroke, and type 2 diabetes, while drawing on recent syntheses to frame expectations and interpret findings. We aimed to describe patient populations and intervention models, summarize primary outcomes, and identify common mechanisms, optimization of guideline-directed therapy, structured follow-up, and patient empowerment, through which MDC might confer benefit.

METHODS

We followed PRISMA guidance for reporting a systematic review. The corpus of original studies was limited to seven users-supplied primary studies. We included original comparative studies (randomized or observational) that evaluated multidisciplinary, team-based care (specialized heart failure clinic, organized stroke unit, integrated diabetes team) versus usual care, and reported clinical or utilization outcomes (mortality, readmission, length of stay, quality of life, functional capacity, or cardiometabolic control). We excluded non-comparative reports. One included study was a registered trial protocol

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and was extracted as background (no results). Information sources and selection: We did not perform de novo database searches; instead, we screened and extracted the seven provided studies.

Two tables were constructed to summarize design, population, interventions, comparators, follow-up, and outcomes. From each eligible study, we extracted study design, setting, sample size, eligibility, intervention team composition and processes, comparator description, follow-up duration, and outcomes. Given heterogeneity across conditions and study designs, we conducted a narrative synthesis without meta-analysis. Where possible, we report absolute counts, proportions, or differences as stated in the articles. No imputation of missing data was performed. Primary outcomes were mortality, hospital readmission or hospitalization, length of stay (LOS), and (condition-specific) functional or patient-reported outcomes (Minnesota Living with Heart Failure Questionnaire), and risk-factor control (HbA1c, lipids). Secondary outcomes included medication optimization, adherence, and exercise capacity.

RESULTS

Seven original studies met inclusion. Two randomized controlled trials (RCTs) evaluated multidisciplinary heart failure (HF) programs; two retrospective cohorts assessed stroke unit implementation; one RCT and one real-world comparative study evaluated multidisciplinary diabetes management; and one RCT protocol in diabetes was included as background. Key characteristics are summarized in Table 1 and key outcomes in Table 2.

Heart failure: The Indian randomized trial of a multidisciplinary heart failure clinic (n=80) reported substantially fewer HF readmissions over 12 months in the intervention arm (30% vs 60%; p=0.04), alongside better quality of life (MLHFQ), greater 6-minute walk distance, higher medication adherence, and more frequent use of ACE inhibitors/ARBs, beta-blockers, and MRAs. Composite death or HF hospitalization was numerically lower but not statistically significant at one year, with survival curves beginning to separate after 5–6 months, suggesting benefits may accrue over time. A six-month U.S. RCT in high-risk, recently hospitalized CHF patients (n=200) found fewer CHF admissions and deaths numerically in MDC compared with usual care (43 admissions + 7 deaths vs 59 + 13; p=0.09), and significant improvements in quality of life, target dosing, and dietary compliance at similar per-patient cost. Together, these trials indicate consistent improvements in utilization and patient-reported outcomes, with neutral short-term mortality effects. Stroke: In a Canadian before–after analysis encompassing 4028 patients, establishment of a comprehensive stroke unit was associated with shorter length of stay (mean 15 vs 19 days) and a 30% adjusted reduction in the odds of LOS >7 days, alongside a 4.5% absolute reduction in in-hospital case fatality. A Brazilian real-world study (n=1440) similarly found a 43% reduction in the likelihood of prolonged hospitalization after stroke unit implementation, though in-hospital and 3-, 6-, and 12-month mortality did not differ significantly.

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Table 1: Characteristics of included studies

Study (Year)	Country/Setting	Design/N	Population	Intervention (MDC)	Comparator	Follow-up
Pant et al. (2022)	India; tertiary HF clinic	RCT; n=80	Stable HFrEF outpatients	Multidisciplinary HF clinic: cardiologist, trained nurses, social worker, dietitian; optimisation to targets; MLHFQ, 6MWT, adherence assessed	Usual cardiology clinic	12 months
Kasper et al. (2002)	USA; academic hospitals	RCT; n=200	Recently hospitalized CHF at high readmission risk	Cardiologist + HF nurse + telephone nurse coordinator + PCP; algorithm-guided follow-up and medication titration	Usual care	6 months
Zhu et al. (2009)	Canada; Foothills Medical Center	Retrospective cohorts; n=4028 (SU 2461; pre-SU 1567)	Acute stroke inpatients	Multidisciplinary stroke unit (high-obs + subacute units; team rounds; early rehab)	General neurology/medical wards (pre-unit)	Index admission
Poll et al. (2024)	Brazil; public tertiary hospital	Retrospective cohorts; n=1440 (pre-674; SU 766)	Acute ischemic stroke inpatients	Type III stroke unit; multidisciplinary team; protocolized care	Pre-implementation general ward care	In-hospital; 3/6/12-mo mortality
Zhuang et al. (2025)	China; single center	RCT; n=216	Older adults with type 2 diabetes (hospitalized)	Multidisciplinary team + experience-based co-design (EBCD) with education/support	Standard care	26 weeks
Ahmed et al. (2024)	Saudi Arabia/Egypt; private centers	Comparative records review; n=834 (DMP 537; PLC 279)	T2DM outpatients over 1 year	Multidisciplinary Diabetes Management Program (coordinator, diet, education, pharmacist, scheduled monitoring)	Physician-led care (variable visits)	12 months
Tan et al. (2019)	Singapore; diabetes clinic	RCT protocol; planned n=50	High-risk T2DM with nephropathy (HbA1c ≥9%)	Intensive multidisciplinary care with patient empowerment + technology (glucometers, BP monitors, tablet app)	Routine clinical care	Planned 3 years

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Table 2: Primary outcomes and main findings

Study	Primary outcomes	Key results	Secondary outcomes	Notes
Pant et al. (2022)	Composite death or HF hospitalization; death; HF hospitalization	Composite: 42.5% vs 57.5% (NS); HF readmission lower with MDC (30% vs 60%, p=0.04)	Better QoL (MLHFQ), 6MWT, adherence; higher ACEi/ARB, beta-blocker, MRA use; EF and NYHA improved	Kaplan–Meier curves diverged after 5–6 months
Kasper et al. (2002)	Composite CHF admissions + deaths over 6 months	43 CHF admissions + 7 deaths (MDC) vs 59 admissions + 13 deaths (usual), p=0.09	Improved QOL, target vasodilator therapy, dietary compliance; similar cost per patient	High-risk post-discharge population
Zhu et al. (2009)	Length of stay (LOS); in-hospital case fatality	Mean LOS 15 days (SU) vs 19 days (general); adjusted odds of LOS >7 days reduced by =30%; in-hospital fatality reduced by 4.5%	—	Dedicated unit with early rehabilitation
Poll et al. (2024)	LOS; in-hospital and post-discharge mortality	Admission to SU associated with 43% reduction in prolonged LOS; no significant difference in in-hospital or 3/6/12-mo mortality	Improved protocol adherence, early rehab indicators	Real-world implementation study
Zhuang et al. (2025)	HbA1c, FBG, BMI, lipids, renal indices, QoL at 26 weeks	Significant improvements in HbA1c, FBG, BMI, lipids, renal function; QoL domains improved (P<0.05)	—	MDT with experience-based co-design
Ahmed et al. (2024)	Proportion achieving HbA1c <7% and LDL-C <70 mg/dL	Greater HbA1c reduction in MDC (−0.5% vs −0.2%, p=0.0001); more achieved HbA1c <7% (49.4% vs 38.7%, p=0.038); LDL-C goal similar	Implementation gaps in nutrition, dental, foot care processes	Comparative practice-based study
Tan et al. (2019)	Cardiovascular events; nephropathy progression; ESRD; risk-factor control	Protocol—no outcome data yet (trial registered, NCT03413215)	Exploratory imaging: femoral IMT; remote follow-up via technology	High-risk cohort with empowerment tools

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These results align with long-standing randomized and meta-analytic evidence indicating that organized stroke unit care improves survival, independence, and discharge home by one year in many contexts, while contemporary implementations reliably reduce LOS with variable effects on mortality over shorter horizons.

Type 2 diabetes: A 26-week RCT of an MDT plus experience-based co-design in older inpatients with T2DM (n=216) demonstrated significant improvements in HbA1c, fasting glucose, BMI, lipids, renal function, and multiple quality-of-life domains versus standard care. A comparative real-world study across two centers (n=834) found greater HbA1c reduction (−0.5% vs −0.2%) and a higher proportion achieving HbA1c <7% in the multidisciplinary program than in physician-led care, with similar LDL-C goal attainment. Process evaluations revealed high completion of personal health coordination but gaps in dental and foot care, highlighting implementation targets.

DISCUSSION

This review integrates condition-specific trials and real-world evaluations with contemporary syntheses to clarify where multidisciplinary care (MDC) delivers the most reliable value. In acute stroke, decades of randomized evidence synthesized by the Stroke Unit Trialists' Collaboration shows that organized stroke units reduce death, institutionalization, and dependency without prolonging stay, and facilitate earlier discharge (Stroke Unit Trialists' Collaboration 2013; Sun et al. 2013). Our included real-world cohorts reinforce shorter length of stay with recent implementations, while mortality effects varied across settings and follow-up windows—consistent with meta-analytic findings that benefits on independence and living at home may be more sensitive to unit model and post-acute pathways than to in-hospital mortality alone. Mechanistically, teams embed early rehabilitation, protocolized monitoring, and coordinated discharge planning.

In heart failure, RCTs demonstrate improvements in readmissions, quality of life, and optimization of guideline-directed therapy with MDC, with neutral effects on short-term mortality. These patient-centered and process gains mirror broader hospital teamwork literature, which ties interdisciplinary teams to fewer adverse events, shorter length of stay, and higher satisfaction (Epstein 2014). For diabetes, a 2024 primary-care meta-analysis showed consistent reductions in systolic/diastolic blood pressure, HbA1c, and LDL-C with multidisciplinary collaboration, especially when combining pharmacologic and behavioral components and mixed in-person/remote formats (Tu et al. 2024). Our included RCT and real-world study is congruent, demonstrating improved glycemic control and care processes. More broadly, recent systematic reviews across non-hospital settings and chronic illness cohorts report patient-reported improvements and some utilization benefits, though clinical endpoints and costs are heterogeneous and context-dependent (Shi et al. 2025; Kongkar et al. 2025).

In oncology, the rationale for multidisciplinary review is strong, and a large 2025 meta-analysis reported reduced risk of death for patients discussed at MDTs across

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multiple cancers, albeit with high heterogeneity; effect sizes stabilized for specific tumor types such as breast and hepatocellular carcinomas (Williams & Thompson 2025). Earlier appraisals emphasized challenges in evidencing direct survival impact but supported improvements in staging accuracy, protocol adherence, and trial access (Patkar et al. 2011). These observations parallel internal mechanisms seen in cardiovascular and cerebrovascular MDTs: better protocol fidelity, timely escalation, and coordinated transitions.

MDC most consistently improves: (1) utilization metrics (readmissions, LOS), (2) patient-reported outcomes and functional capacity, (3) attainment of risk-factor targets and medication optimization, and (4) adherence to guideline-based processes. Mortality benefits are context-specific and may require longer follow-up, adequate team resourcing, and robust post-discharge integration. Implementation fidelity matters: the diabetes program's gaps in dental/foot care suggest room to tighten comprehensive pathway delivery. Future work should prioritize pragmatic cluster-RCTs and stepped-wedge designs with standardized fidelity measures, longer follow-up, and economic evaluation to clarify sustainability across health systems.

CONCLUSION

Across heart failure, stroke, and diabetes, multidisciplinary care reliably improves processes and patient-centered outcomes—reducing readmissions and length of stay, enhancing quality of life and functional capacity, and improving cardiometabolic control—while short-term mortality effects are mixed. Benefits emerge where teams combine protocolized clinical management, early rehabilitation, and patient empowerment with coordinated transitions of care. Implementation quality and context shape effect sizes. Scaling MDC should include explicit fidelity metrics and pragmatic evaluation to ensure durable gains and equitable access across diverse settings.

References

1) Ahmed YH, Elbadawi HS, Sultan I, et al. Implementation and Outcomes of Multidisciplinary Diabetes Management Program Among Type 2 Diabetic Patients: A Comparative Study. Cureus. 2024;16(5): e60979. doi:10.7759/cureus.60979.

2) Epstein NE. Multidisciplinary in-hospital teams improve patient outcomes: A review. Surg Neurol Int. 2014;5(Suppl 7): S295-S303. doi:10.4103/2152-7806.139612.

3) Kasper EK, Gerstenblith G, Hefter G, et al. A randomized trial of the efficacy of multidisciplinary care in heart failure outpatients at high risk of hospital readmission. J Am Coll Cardiol. 2002;39(3):471-480.

4) Kongkar R, Ruksakulpiwat S, Phianhasin L, et al. The impact of interdisciplinary team-based care on the care and outcomes of chronically ill patients: a systematic review. J Multidiscip Healthc. 2025; 18:445-457.

5) Pant BP, Satheesh S, Pillai AA, et al. Outcomes with heart failure management in a multidisciplinary clinic – A randomized controlled trial. Indian Heart J. 2022; 74:327-331. doi: 10.1016/j.ihj.2022.06.005.

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6) Patkar V, Acosta D, Davidson T, Jones A, Fox J, Keshtgar M. Cancer Multidisciplinary Team Meetings: Evidence, Challenges, and the Role of Clinical Decision Support Technology. Int J Breast Cancer. 2011; 2011:831605. doi:10.4061/2011/831605.

7) Poll M, Martins RT, Anschau F, Jotz GP. Length of Hospitalization and Mortality among Stroke Patients before and after the Implementation of a Specialized Unit: A Retrospective Cohort Study Using Real-World Data from One Reference Hospital in Southern Brazil. Healthcare (Basel). 2024;12(8):836. doi:10.3390/healthcare12080836.

8) Shi Y, Li H, Yuan B, Wang X. Effects of multidisciplinary teamwork in non-hospital settings on healthcare and patients with chronic conditions: a systematic review and meta-analysis. BMC Prim Care. 2025; 26:110. doi:10.1186/s12875-025-02814-0.

9) Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev. 2013;(9):CD000197. doi: 10.1002/14651858.CD000197.pub3.

10) Sun Y, Paulus D, Eyssen M, Maervoet J, Saka O. A systematic review and meta-analysis of acute stroke unit care: What's beyond the statistical significance? BMC Med Res Methodol. 2013; 13:132.

11) Tan E, Khoo J, Gani LU, et al. Effect of multidisciplinary intensive targeted care in improving diabetes mellitus outcomes: IDEALS randomized controlled pilot study protocol. Trials. 2019; 20:549. doi:10.1186/s13063-019-3601-3.

12) Tu Q, Lin S, Hyun K, et al. The effects of multidisciplinary collaborative care on cardiovascular risk factors among patients with diabetes in primary care settings: A systematic review and meta-analysis. Prim Care Diabetes. 2024; 18:381-392. doi: 10.1016/j.pcd.2024.05.003.

13) Williams GJ, Thompson JF. Management changes and survival outcomes for cancer patients after multidisciplinary team discussion; a systematic review and meta-analysis. Cancer Treat Rev. 2025; 120:102997. doi: 10.1016/j.ctrv.2025.102997.

14) Zhu HF, Newcommon NN, Cooper ME, et al. Impact of a Stroke Unit on Length of Hospital Stay and in-Hospital Case Fatality. Stroke. 2009; 40:18-23.

15) Zhuang Y, Ye H, Yang X, et al. The effect of multidisciplinary team and experience-based co-design on the care of older adult patients with type 2 diabetes: A randomized controlled trial. Diabetes Res Clin Pract. 2025; 212:112028. doi: 10.1016/j.diabres.2025.112028.