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Closing the Healthcare Fragmentation Gap: A Multidisciplinary Framework for Integrating Diagnostic Services, Therapeutic Interventions, and Patient-Centered Care: A Narrative Review

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ABSTRACT: Healthcare fragmentation, the disconnection of services across providers, settings, and time, undermines diagnostic accuracy, treatment coherence, and patients' experience of care. This narrative review synthesizes literature published between 2017 and 2023 on fragmentation and integration, and proposes a multidisciplinary framework for connecting diagnostic services, therapeutic interventions, and patient-centered care. Findings are organized thematically and appraised qualitatively. Evidence indicates that fragmentation arises from structural, informational, relational, and temporal gaps and contributes to missed or delayed diagnosis, duplicated or conflicting treatment, and avoidable harm. Integrated care models, interprofessional teamwork, structured communication, transitional care, shared decision making, and attention to social needs show benefits for experience and care processes, although effects on clinical outcomes and costs are mixed. The proposed framework spans patient, team, organizational, and policy levels. Implications for practice, education, policy, and research are discussed, emphasizing measurement and equity. Multimorbidity, transitions, and unmet social needs are highlighted as priority areas.

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1. INTRODUCTION

Modern healthcare delivers extraordinary technical capability, yet patients routinely experience it as a series of disconnected encounters. A person with a suspected cancer may see a primary care clinician, undergo imaging at one facility, have blood tests at another, receive specialist advice at a third, and be treated in a fourth, with each step governed by different records, schedules, and incentives. The person must often act as the courier of information and the coordinator of care. This pattern, commonly described as fragmentation, has been recognized as a defining weakness of health systems and a driver of avoidable harm, wasted resources, and dissatisfaction among both patients and clinicians (Kern et al., 2019).

Fragmentation matters because the core tasks of healthcare are inherently interdependent. Accurate diagnosis depends on the quality of clinical assessment, the interpretation of tests, and the communication of results to those who act upon them. Effective treatment depends on a correct diagnosis, a coherent plan across multiple prescribers and services, and the patient's ability to carry it out. Patient-centered care depends on listening to the patient's goals and circumstances and on shaping both diagnosis and treatment accordingly. When these elements are handled by separate parties that do not communicate well, the system as a whole performs worse than the sum of its components. The patient safety literature has repeatedly identified diagnostic safety, care transitions, and the reliability of everyday processes as areas of persistent weakness (Bates & Singh, 2018), and the World Health Organization's global action plan calls for safer, better coordinated, and more people-centered systems (World Health Organization [WHO], 2021).

The economic implications are also considerable. Patient harm is costly, and a substantial portion of it is preventable (Slawomirski et al., 2017). Policy statements on primary health care have likewise stressed that health systems must be organized around the needs of people and communities, with coordinated services that span prevention, diagnosis, treatment, and rehabilitation (WHO & United Nations Children's Fund [UNICEF], 2018). Despite broad agreement on the goal, there is less clarity about how diagnostic services, therapeutic interventions, and patient-centered care can be integrated in practice. Research and policy often address these domains separately, with diagnostic safety researchers, care coordination specialists, and patient engagement advocates working in parallel.

This narrative review aims to bring these strands together. Its objectives are to characterize the nature and consequences of fragmentation across diagnostic, therapeutic, and patient-centered domains; to synthesize evidence on integrative strategies published between 2017 and 2023; to propose a multidisciplinary framework that connects the strategies across patient, team, organizational, and policy levels; and to identify implications for practice, education, policy, and research. A narrative approach was chosen because the relevant literature is conceptually diverse and methodologically heterogeneous, which limits the usefulness of quantitative pooling.

2. METHODS

This article is a narrative review, suited to interpretive synthesis of broad bodies of literature. Narrative reviews do not follow the fully standardized procedures of systematic reviews, but they should state their question, scope, and approach to source selection. The guiding question was: what is the nature of healthcare fragmentation across diagnostic services, therapeutic interventions, and patient-centered care, and which multidisciplinary strategies can integrate them effectively?

Literature published between 2017 and 2023 was prioritized. Sources were identified by searching biomedical, health services, and social science databases with combinations of terms for fragmentation, integrated care, care coordination, multidisciplinary and interprofessional teams, diagnostic error, transitions of care, multimorbidity, patient-centered care, shared decision making, and social determinants of health. Citation tracking and reports from international organizations supplemented the searches. Priority was given to systematic reviews, meta-analyses, randomized trials, large observational studies, conceptual frameworks, and policy analyses. Single-site descriptive studies were used only where they illuminated mechanisms not addressed in reviews.

Findings were organized thematically, and the strength of the evidence for each strategy was judged qualitatively on the basis of study design, consistency of results, and directness of the outcome measures. These judgments are interpretive rather than formal evidence grades.

3. UNDERSTANDING HEALTHCARE FRAGMENTATION

Fragmentation is not a single phenomenon but a family of related problems. Figure 1 depicts three care domains considered in this review, namely diagnostic services, therapeutic interventions, and patient-centered care, together with four types of gap

that separate them. The figure also summarizes the consequences of fragmentation and the integrative mechanisms discussed in later sections.

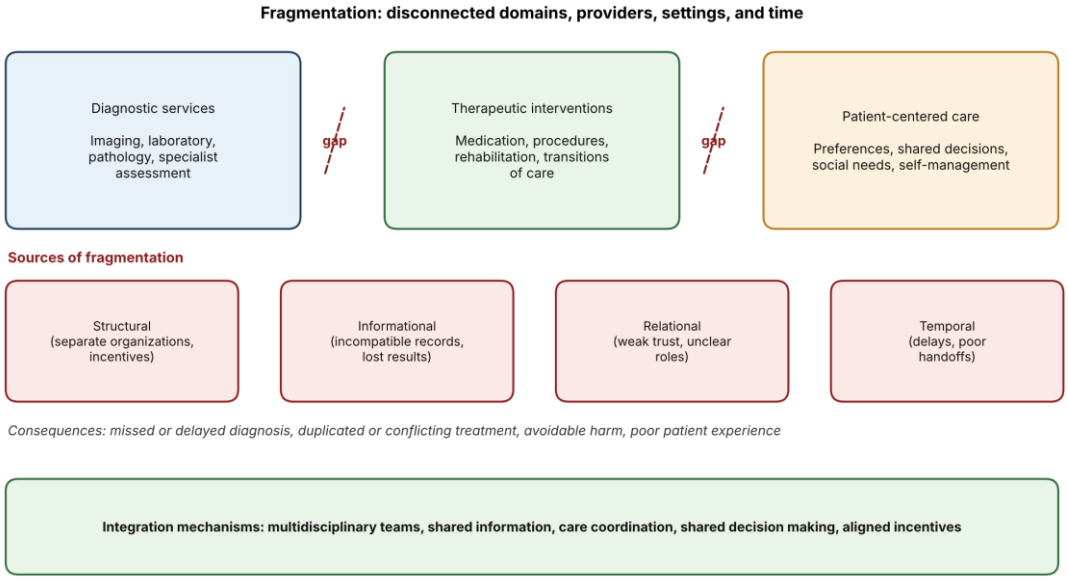


Figure 1. Domains, sources, and consequences of healthcare fragmentation and the integration mechanisms that address them

3.1 Forms and causes

A systematic review of patients' and providers' views on fragmentation in the ambulatory setting identified several causes, including the involvement of multiple providers and organizations, incomplete communication between them, incompatible information systems, and care processes organized around the convenience of services rather than patients (Kern et al., 2019). These causes can be grouped into four types, which structure the discussion in this review. Structural fragmentation reflects the division of care among separate organizations with distinct governance, funding, and incentives. Informational fragmentation arises when records, results, and care plans cannot be shared or are not visible when needed. Relational fragmentation reflects weak trust, unclear roles, and limited communication among professionals and between professionals and patients. Temporal fragmentation refers to discontinuity across time, as at transitions between settings and in delays between steps in a care pathway.

These types interact. A structurally divided system tends to produce incompatible information systems, which in turn weaken relationships because professionals cannot see one another's work. Relational and temporal gaps may then compound, as clinicians who do not know each other are less likely to pick up the telephone to clarify an ambiguous result, and delays accumulate. Recognizing these interactions suggests that interventions targeting a single type of gap, such as a shared record without attention to roles and relationships, are likely to be insufficient.

3.2 Consequences for patients and systems

The consequences of fragmentation are documented in both qualitative and quantitative research. Patients and providers describe duplicated tests, conflicting advice, delays, and loss of information, and they link these to frustration, loss of trust, and harm (Kern et al., 2019). At the system level, fragmentation contributes to inefficiency and to the burden of preventable adverse events (Slawomirski et al., 2017). Fragmentation also affects the workforce. Systematic reviews have linked clinician burnout to lower quality and safety of care, and a framework from the National Academy of Medicine described burnout as an underrecognized threat that is partly driven by dysfunctional organization of work (Dyrbye et al., 2017; Panagioti et al., 2018). Time spent searching for information or coordinating across disconnected services is a plausible contributor to this burden.

The consequences are not distributed evenly. Patients with multiple chronic conditions, complex social needs, limited health literacy, or limited English proficiency are more exposed to fragmentation and more affected by it. They typically interact with more services, and each additional interface increases the opportunity for information loss. This observation motivates the attention given in this review to multimorbidity and social needs.

3.3 Measuring fragmentation

Progress in addressing fragmentation is hampered by difficulties of measurement. Fragmentation can be assessed from the perspective of patients, through surveys of experience and reports of gaps in communication; from the perspective of providers, through assessments of the ease of obtaining information and coordinating with colleagues; and from administrative data, through patterns such as the number of distinct providers seen or the dispersion of care across organizations. Each approach captures a different aspect, and none is complete. Patient reports are valuable because they reflect the experience of navigating the system but may not capture failures that patients never see, such as a result that was never communicated. Administrative measures are scalable but may mistake appropriate specialty care for fragmentation. The review of patient and provider views by Kern et al. (2019) illustrates the value of combining perspectives, since patients and providers emphasized overlapping but not identical causes. Multiteam system approaches to care coordination offer another way to conceptualize measurement, by focusing on the quality of linkages within and between teams (Weaver et al., 2018). A pragmatic implication is that organizations should use several complementary measures and should involve patients in interpreting them.

4. FRAGMENTATION IN DIAGNOSTIC SERVICES

Diagnosis is a process distributed across many people and services, and it is therefore especially vulnerable to fragmentation. A diagnosis typically depends on the patient's account of symptoms, a clinician's assessment, tests ordered and performed by others, interpretation by radiologists, pathologists, or laboratory professionals, and communication of the results back to the patient and clinician. Each step is an opportunity for error or delay.

4.1 Scale of diagnostic error and its system causes

Diagnostic error is common and consequential. A review of primary care studies concluded that errors affect a meaningful proportion of encounters worldwide and that estimates depend on how errors are defined and detected (Singh et al., 2017). An analysis of malpractice claims showed that a small number of disease categories, namely vascular events, infections, and cancers, account for a large share of serious misdiagnosis-related harm (Newman-Toker et al., 2021). Zwaan and Singh (2020) argued that research on hospital diagnostic error has too often concentrated on individual cases and called for attention to recurrent system-level patterns. Such patterns include missed follow-up of abnormal results, incomplete information at the point of decision, and poor communication among those involved in the diagnostic process. These are characteristic expressions of informational and relational fragmentation.

4.2 The diagnostic team and the role of patients

Graber et al. (2017) described the diagnostic team as comprising not only treating clinicians but also nurses, radiologists, pathologists, laboratory professionals, pharmacists, and the patient. This broader view treats diagnostic safety as a shared responsibility and suggests that integration of diagnostic services with clinical care is a prerequisite for accuracy. When those who generate and interpret test results are remote from those who treat the patient, nuances in findings may be lost, and uncertainty may not be communicated. Direct communication, shared access to information, and mechanisms for tracking results through to action are therefore central.

Patients contribute information that no test can provide, and they notice failures that systems may not detect. Giardina et al. (2018) argued that learning from patients' experiences of diagnostic error is essential for progress in patient safety, because patients can describe delays, dismissed concerns, and repeated visits for the same problem. Incorporating patient reports into diagnostic quality review is thus a way to bridge relational gaps between patients and services. It also recognizes that patients are an integral part of the diagnostic process rather than recipients of its output.

4.3 Integrating diagnostic services with clinical care

Several strategies can reduce fragmentation in diagnosis. Multidisciplinary case review, in which radiologists, pathologists, and treating clinicians discuss complex cases together, brings diverse perspectives to bear and reduces the risk that a single

interpretation goes unchallenged. Structured communication tools can improve the clarity of information transfer between professionals and across handoffs. Shared electronic records can make test results and clinical context visible to all those involved, although the effectiveness of such systems depends on interoperability and on organizational willingness to share information. A study of information blocking in the United States found evidence that some providers and vendors restricted information exchange, indicating that structural incentives, rather than technical limitations alone, may impede integration (Adler-Milstein & Pfeifer, 2017).

Digital decision support can also assist integration by prompting consideration of alternative diagnoses and flagging overdue follow-up. An overview of clinical decision support systems described benefits such as improved adherence to guidelines but also risks such as alert fatigue and workflow disruption, and it stressed the importance of integration with clinical workflow (Sutton et al., 2020). Broader discussions of artificial intelligence in medicine have emphasized that the technology is most promising when it supports, rather than replaces, collaboration among clinicians and when it is embedded in thoughtfully designed workflows (Topol, 2019). From the perspective of fragmentation, such tools are additional participants in the diagnostic team that must be connected to the human participants through clear roles and communication.

4.4 Primary care as a hub for diagnostic integration

Primary care occupies a pivotal position in diagnostic integration because it is the point at which many symptoms first present and to which results and specialist opinions are returned. The global review of diagnostic error in primary care emphasized that the context of primary care, with undifferentiated symptoms, limited access to tests, and brief encounters, creates distinctive diagnostic challenges (Singh et al., 2017). A health system in which primary care teams have timely access to diagnostic services, can communicate directly with specialists, and maintain continuity with patients is better placed to diagnose accurately. The WHO and UNICEF vision for primary health care similarly identifies multidisciplinary teams, integrated services, and a strong relationship with communities as the foundations of high-quality care (WHO & UNICEF, 2018). Strengthening primary care capacity for diagnosis, through investment in staffing, access to imaging and laboratory services, and decision support, may therefore be among the most effective ways to close diagnostic fragmentation.

5. FRAGMENTATION IN THERAPEUTIC INTERVENTIONS

Once a diagnosis is made, treatment often involves multiple professionals, settings, and interventions over an extended period. Fragmentation in therapy takes several characteristic forms: conflicting recommendations from different specialists, unreconciled medications, poorly executed transitions between hospital and community, and a lack of shared responsibility for the overall plan.

5.1 Multimorbidity and the problem of single-disease care

A principal driver of therapeutic fragmentation is multimorbidity, the coexistence of multiple long-term conditions. A review of multimorbidity described it as highly prevalent, associated with worse quality of life, higher health service use, and higher mortality, and challenging for systems organized around single diseases (Skou et al., 2022). When each condition is managed by a different specialist following a different guideline, the combined treatment burden may be unmanageable, and recommendations may conflict. A Cochrane review of interventions to improve outcomes in patients with multimorbidity in primary care and community settings found that the effects of the interventions studied were mixed, with some benefit when interventions targeted specific risk factors or functional difficulties, but limited evidence of improvements in clinical outcomes overall (Smith et al., 2021).

Frameworks for integrated care for multimorbidity propose that systems must address several elements simultaneously, including service delivery, leadership and governance, workforce, financing, technologies and information systems, and the central role of the person (Leijten et al., 2018). This multilevel perspective informs the framework presented later in this review. It also underscores that integrated treatment is not achieved through a single intervention but through the alignment of many components.

5.2 Transitions of care and medication management

Transitions between settings are well-recognized points of vulnerability. A systematic review and meta-analysis found that interventions to improve communication at hospital discharge were associated with a modest reduction in readmission (Becker et al., 2021). A review focusing on high-risk older adults concluded that transitional care interventions can reduce unplanned

readmissions (Finlayson et al., 2018), and a network meta-analysis in heart failure found that services such as nurse home visits and multidisciplinary heart failure clinics were associated with improved outcomes compared with usual care (Van Spall et al., 2017). These findings show that the active involvement of professionals who span the boundary between hospital and community can reduce temporal and informational fragmentation.

Medication management illustrates both the potential and the limits of integration. Medication review is widely proposed as a means of reducing harm from polypharmacy, but a systematic review of medication review interventions in older people reported inconsistent effects on readmission, suggesting that review is most effective when linked to follow-up and coordinated care rather than delivered in isolation (Dautzenberg et al., 2021). The lesson is that integration is not simply about adding a service but about connecting it to the rest of the care pathway.

5.3 Care coordination as a multiteam challenge

Care coordination is the deliberate organization of activities among participants to deliver services safely and efficiently. Weaver et al. (2018) proposed viewing care coordination through a multiteam system lens, in which multiple teams with their own goals must align to achieve a shared objective. Their framework and review highlighted that coordination depends on mechanisms at the level of individual teams and between teams, including shared goals, role clarity, and communication processes. This perspective is valuable because it recognizes that patients are often cared for by several teams at once, such as a primary care team, a specialist service, and a community nursing team, and that coordination is a property of the relationships among them.

Hospital-level care at home provides an example of an integrated therapeutic model. A randomized trial of hospital-level care delivered at home for acutely ill adults reported lower costs and less use of some services than inpatient care, along with better mobility, without evidence of worse outcomes (Levine et al., 2020). Such models require close coordination among physicians, nurses, and other professionals and show that reconfiguring the setting of care can be feasible when the team and its processes are designed around the patient.

5.4 Remote and digitally enabled models

Digitally enabled care models may reduce some forms of fragmentation by extending the reach of teams and by making information available across settings. Remote monitoring, virtual consultation, and shared digital records can connect patients to clinicians and clinicians to one another without requiring travel or physical co-location. Reviews of digital innovations in medicine caution, however, that technology alone does not integrate care and that tools introduced without attention to workflow may add a further layer of fragmentation, for example when a new platform does not communicate with existing systems (Sutton et al., 2020; Topol, 2019). The hospital-at-home experience suggests that technology is most effective when it supports an integrated team with clear roles and a defined pathway, rather than when it substitutes for them (Levine et al., 2020).

Table 1. Fragmentation Across Diagnostic, Therapeutic, and Patient-Centered Domains and Integrative Strategies

Domain	Typical fragmentation gap	Consequence	Integrative strategy	Key sources
Diagnostic services	Test results not reaching or tracked by the responsible clinician; siloed interpretation	Missed or delayed diagnosis	Closed-loop result tracking; multidisciplinary case review; shared records	Graber et al., 2017; Zwaan & Singh, 2020
Diagnostic services	Patient concerns not captured in diagnostic review	Unrecognized error; loss of trust	Patient reports in quality review; patient as team member	Giardina et al., 2018
Therapeutic interventions	Single-disease care for multimorbidity; conflicting specialist advice	High treatment burden; conflicting plans	Integrated multimorbidity models; coordinated care planning	Skou et al., 2022; Leijten et al., 2018

Therapeutic interventions	Poor hospital-to-community transitions	Readmission; medication errors	Discharge communication; transitional care; nurse home visits	Becker et al., 2021; Finlayson et al., 2018; Van Spall et al., 2017
Therapeutic interventions	Isolated medication review	Inconsistent effect on outcomes	Link review to follow-up and coordinated care	Dautzenberg et al., 2021
Patient-centered care	Preferences not elicited; options poorly explained	Care misaligned with values	Decision aids; shared decision making	Stacey et al., 2017
Patient-centered care	Social needs unaddressed by health services	Barriers to treatment adherence and recovery	Social needs screening with linkage to community resources	Gurewich et al., 2020; Fraze et al., 2019; Kuluski et al., 2017

6. PATIENT-CENTERED CARE AS THE INTEGRATING PRINCIPLE

Patient-centered care offers a principle for integrating diagnostic and therapeutic services because it places the patient's needs, values, and goals at the center of the pathway. It is also a response to fragmentation, since patients experience the system as a whole and notice its disconnections more than do the professionals within it.

6.1 Concepts and frameworks

The terms patient-centered care, person-centered care, and related concepts are used variably. A review of reviews found considerable overlap between patient-centered and person-centered care but also conceptual ambiguity, with common themes including partnership, patient participation, and attention to the individual's context (Håkansson Eklund et al., 2019). A conceptual framework for practicing person-centred care organized it across foundational elements, practices, and outcomes, offering a way to connect organizational preconditions with the behaviors of clinicians and the benefits for patients (Santana et al., 2018). These frameworks are helpful because they show that patient-centeredness is not only a matter of clinician attitudes but also depends on structures such as time, information systems, and team arrangements.

6.2 Shared decision making and patient engagement

Shared decision making is a core mechanism of patient-centered care, particularly when treatment options carry different risks and benefits that patients may value differently. A Cochrane review of decision aids found that they improve patients' knowledge and the accuracy of their risk perceptions, reduce decisional conflict, and increase the proportion of patients who participate actively in decisions (Stacey et al., 2017). By clarifying preferences, such tools help to ensure that treatment choices reflect the patient's goals, which may reduce unwanted or conflicting treatments across services.

Patient engagement can occur at multiple levels, from the individual consultation to service design and governance. A systematic review of strategies to engage patients to improve quality of care found that engagement at several levels was associated with improvements in care, though the quality of evidence varied and the mechanisms were not always clear (Bombard et al., 2018). Co-design, in which patients and professionals jointly design services, has attracted growing interest. A rapid overview of reviews of research co-design in health concluded that the evidence of effectiveness is still limited but that co-design is widely valued and may improve relevance and acceptability (Slattery et al., 2020).

6.3 Experience, relationships, and multimorbidity

In primary care patients with multimorbidity, patient-centered care and co-creation of care were associated with greater satisfaction and better physical and social well-being (Kuipers et al., 2019). This finding is consistent with the argument that relational continuity, in which patients have an ongoing relationship with a clinician or team who know them, helps to mitigate the effects of a structurally complex system. A continuing relationship allows the clinician to interpret test results in context, to coordinate across services, and to advocate for the patient. Patient-centered care and integration are therefore mutually

reinforcing: integration provides the infrastructure that allows professionals to be responsive to the patient, and patient-centeredness provides the direction for integration.

6.4 Social needs and the wider determinants of health

Patient-centered care must extend beyond medical issues to include social and economic circumstances that shape health and the ability to follow treatment. A framework for addressing social determinants of health within healthcare delivery systems proposed ways for organizations to identify needs, link patients to resources, and align services with community partners (Gurewich et al., 2020). A systematic review of interventions on patients' social and economic needs found that some interventions improved outcomes, although the evidence was often of limited quality (Wing & Adler, 2017). Meanwhile, a national survey found that only a minority of US physician practices and hospitals screened for a full range of social needs such as food insecurity and housing instability (Fraze et al., 2019). The gap between recognition and action reflects another form of fragmentation, between health and social care. Community care for people with complex needs requires bridging this divide through partnerships and shared planning (Kuluski et al., 2017).

7. A MULTIDISCIPLINARY FRAMEWORK FOR CLOSING THE GAP

Drawing on the preceding analysis, this section proposes a framework for integrating diagnostic services, therapeutic interventions, and patient-centered care. Figure 2 presents the framework as nested layers. At the center are the patient and family, who connect and are served by diagnostic and therapeutic services. Surrounding them is the team level, in which multidisciplinary teams, care coordinators, and structured communication connect services in daily practice. The organizational level provides governance, shared information systems, care pathways, measurement, and a learning culture. The policy and system level provides payment arrangements, regulation, interoperability standards, workforce policy, and links to social care. Outcomes include diagnostic accuracy, treatment coherence, patient experience, safety, equity, and cost.

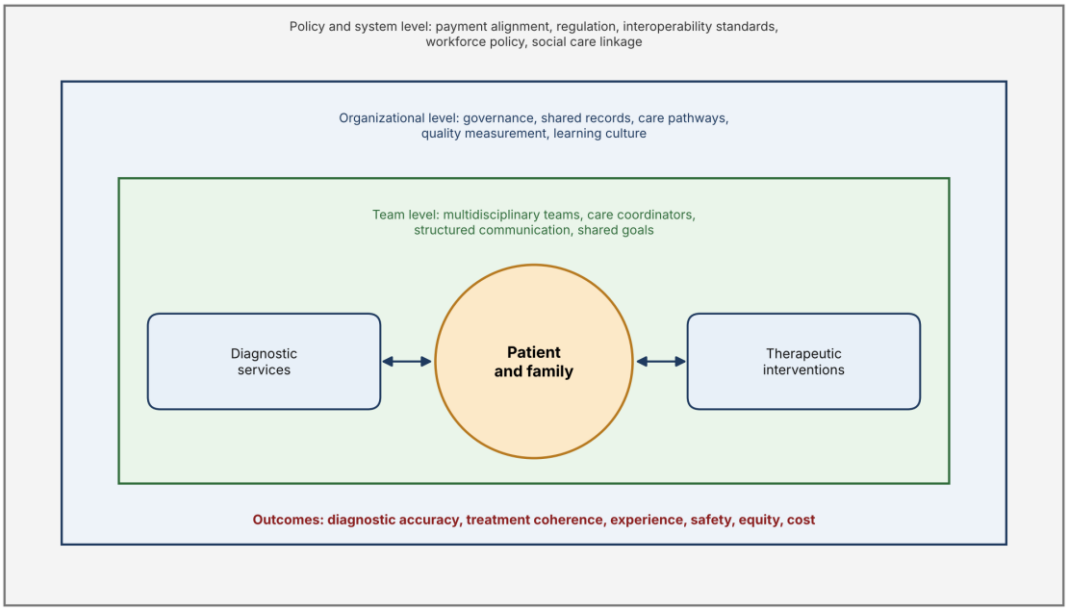


Figure 2. Multilevel framework for integrating diagnostic services, therapeutic interventions, and patient-centered care

7.1 Principles of the framework

The framework rests on four principles. First, integration must be multilevel. Evidence from frameworks for multimorbidity and integrated care indicates that interventions at the level of a single team are unlikely to succeed if organizational and policy conditions work against them (Leijten et al., 2018; Threapleton et al., 2017). Second, integration must be multidisciplinary. The professions involved in diagnosis, therapy, and social support bring distinct knowledge, and their effective collaboration is a precondition for coherent care (Reeves, 2018; Rosen et al., 2018). Third, integration should be patient-directed, with the patient's

goals determining priorities and the patient acting as a partner in the care team (Santana et al., 2018). Fourth, integration should be learning-oriented, with feedback from outcomes and from patients used to improve the system over time (Giardina et al., 2018; WHO, 2021).

7.2 Team-level mechanisms

At the team level, multidisciplinary collaboration is the primary mechanism for connecting diagnostic and therapeutic services. A Cochrane review of interprofessional collaboration interventions found that they can improve some processes and outcomes of care but that the certainty of evidence was low and the interventions varied widely (Reeves, 2018). A synthesis of teamwork research in healthcare concluded that team training, structured communication, and supportive leadership contribute to safer and higher-quality care (Rosen et al., 2018). Evidence-based guidance for overcoming challenges to teamwork emphasizes clear goals, role clarity, shared mental models, and psychological safety (Zajac et al., 2021). A systematic review of how healthcare professionals contribute to interprofessional collaboration highlighted behaviors such as sharing information, negotiating roles, and building relationships as central (Schot et al., 2020).

An overview of reviews on interprofessional collaboration in primary care identified barriers and facilitators at individual, team, and organizational levels, including professional hierarchies and unclear roles as barriers and mutual respect and shared understanding as facilitators (Rawlinson et al., 2021). Care coordinators, such as nurses or case managers, can serve as integrators by following patients across services, tracking results and referrals, and communicating with patients and families. Their effectiveness depends on authority, access to information, and clear relationships with other team members, as the multiteam perspective on care coordination suggests (Weaver et al., 2018).

7.3 Organizational-level mechanisms

At the organizational level, integration requires governance that assigns responsibility for the whole pathway rather than for individual episodes. It requires shared information systems that allow clinicians to see results, plans, and patient preferences, and processes for following up on abnormal results and pending tests. It requires care pathways that define the roles of different services and the expected handoffs, and quality measurement that reflects the continuity and coherence of care as well as the performance of individual units. A learning culture that treats failures as opportunities for improvement is also important, and it depends on leadership that supports psychological safety (Zajac et al., 2021).

Organizational capacity for integration is closely connected with workforce well-being. Burnout is associated with lower quality and safety of care, and organizations that expect extra coordination work without providing time and support may inadvertently undermine integration (Dyrbye et al., 2017; Panagioti et al., 2018). Integration should therefore be designed to reduce unnecessary workload, for example by automating information transfer, rather than to add to it.

7.4 Policy- and system-level mechanisms

Policy settings strongly influence whether integration is feasible. Payment systems that reward volume of services encourage fragmentation, whereas arrangements that reward coordinated care and shared accountability may encourage integration. An evaluation of the Medicare Shared Savings Program after three years found modest savings concentrated among physician-group accountable care organizations and little evidence of savings among hospital-integrated organizations, suggesting that the effects of payment reform depend on organizational context (McWilliams et al., 2018). Regulation of information sharing and interoperability standards matters, as shown by evidence of information blocking (Adler-Milstein & Pfeifer, 2017). Workforce policy affects the supply and distribution of the professionals needed for multidisciplinary teams, and policies linking health and social services affect the capacity to address social needs (Gurewich et al., 2020; Kuluski et al., 2017).

International policy frameworks provide direction at this level. The vision for primary health care promoted by WHO and UNICEF places multidisciplinary teams and integrated services at the heart of the system and emphasizes community engagement (WHO & UNICEF, 2018). The Global Patient Safety Action Plan likewise stresses policies that support safe care, engaged patients, and learning systems (WHO, 2021). Table 2 summarizes selected integration strategies across levels and the evidence supporting them.

Table 2. Selected Integration Strategies by Level and Summary of Evidence

Strategy	Level	Summary of findings	Strength of evidence	Key sources
Interprofessional collaboration interventions	Team	Some improvements in processes and outcomes; low certainty and wide variation	Low	Reeves, 2018; Rosen et al., 2018
Team training and psychological safety	Team	Supports communication and speaking up; guidance based on team effectiveness research	Low to moderate	Zajac et al., 2021; Schot et al., 2020
Care coordination (multiteam perspective)	Team / organization	Coordination depends on shared goals, roles, and communication across teams	Moderate (conceptual and review evidence)	Weaver et al., 2018
Transitional care and discharge communication	Organization	Reduced readmission in older adults and heart failure; modest effect of communication interventions	Moderate	Becker et al., 2021; Finlayson et al., 2018; Van Spall et al., 2017
Hospital-level care at home	Organization	Lower costs and some service use; better mobility; no evidence of worse outcomes	Moderate	Levine et al., 2020
Decision aids and patient engagement	Patient / team	Improved knowledge and reduced decisional conflict; engagement benefits variable in quality	Moderate	Stacey et al., 2017; Bombard et al., 2018
Social needs screening and linkage	Organization / policy	Some improved outcomes; evidence limited; screening not widespread	Low	Wing & Adler, 2017; Fraze et al., 2019
Integrated care models	Organization / policy	Better experience and access; mixed outcomes and cost effects	Low to moderate	Baxter et al., 2018; Rocks et al., 2020
Payment reform (shared savings)	Policy	Modest savings in physician-group organizations; context dependent	Moderate	McWilliams et al., 2018

7.5 Sequencing and implementing the framework

Implementing a multilevel framework is a long-term undertaking, and sequencing matters. Reviews of integrated care for older people and for multimorbidity emphasize that successful implementation depends on leadership commitment, a shared vision, engagement of the workforce, and the capacity to learn from experience (Leijten et al., 2018; Threapleton et al., 2017). In practice, organizations may begin with a priority population, such as patients with multimorbidity or those at high risk of readmission, and with a small number of pathways in which fragmentation is known to cause harm. Early efforts should focus on establishing the team-level mechanisms, such as named coordinators, regular multidisciplinary review, and reliable communication of results, which can be implemented within existing structures.

As experience accumulates, organizational mechanisms can be strengthened, including shared records, pathway redesign, and measurement. Policy-level changes typically require longer timeframes and collaboration with external partners, but organizations can contribute by documenting the barriers they encounter, such as payment rules that discourage coordination or restrictions on information sharing, and by sharing this evidence with policymakers. Throughout, patients should be involved as partners in design and evaluation, in line with evidence that engagement at multiple levels is associated with improvements

in care (Bombard et al., 2018). Attention to barriers identified in primary care collaboration, such as hierarchy, unclear roles, and limited time, should be built into implementation plans from the outset (Rawlinson et al., 2021).

8. EVIDENCE ON THE EFFECTS OF INTEGRATED CARE

A critical question is whether integrated care delivers the benefits claimed for it. A systematic review of UK and international evidence on integrated care found positive effects on patient satisfaction, perceived quality, and access, but results for health outcomes and costs were mixed, with relatively little evidence of cost savings (Baxter et al., 2018). A systematic review and meta-analysis of the cost and effects of integrated care reached a similar conclusion of potential benefits for quality alongside inconsistent economic findings (Rocks et al., 2020). A rapid scoping review of integrated care for older people highlighted that the benefits depend on implementation, and it identified facilitators such as strong leadership, multidisciplinary teams, and information sharing, and barriers such as workforce shortages and poorly aligned funding (Threapleton et al., 2017).

Several reasons may explain the modest and inconsistent effects. Integrated care is an umbrella term that covers diverse interventions, which makes comparison difficult. Many interventions are implemented incompletely or are limited to small parts of the system. Benefits may take years to appear, while evaluations are typically short. Targeting matters as well: interventions tend to show greater effects when aimed at patients with the greatest needs, whereas those applied to broad populations dilute their effect. Finally, outcomes such as cost may be affected by factors that are beyond the control of the integrating organizations.

The weight of evidence therefore supports a nuanced position. Integration appears to improve the experience of care and some care processes, and it holds promise for safety and for outcomes in specific populations such as older adults and those with heart failure (Finlayson et al., 2018; Van Spall et al., 2017). It should not be assumed to reduce costs automatically. Claims should be matched to the evidence, and organizations should invest in evaluation that can distinguish effective from ineffective components.

8.1 Equity considerations

Equity should be a central criterion in evaluating integration. Patients with multimorbidity, social disadvantage, or limited access to services stand to gain the most from integrated care, but they may also be the least likely to benefit if programs are designed without their needs in mind (Skou et al., 2022). Social needs interventions have shown benefits in some studies, but screening is uneven and linkage to resources is often limited (Fraze et al., 2019; Wing & Adler, 2017). Integration efforts that rely on digital tools may exclude those without access or skills, and approaches based on patient engagement may favor those who are more articulate or confident. Monitoring outcomes by patient group and involving diverse communities in design are therefore essential, as is attention to the framework for addressing social determinants within delivery systems (Gurewich et al., 2020).

A related point concerns what is measured. Evaluations of integration often emphasize utilization and cost because these data are readily available, but they may miss outcomes that matter most to patients, such as the coherence of their care, the clarity of the plan, and confidence in managing their conditions. A balanced set of indicators would include diagnostic timeliness and accuracy, rates of unplanned hospital use, medication safety, patient-reported experience of coordination, clinician experience, and equity across patient groups. Because the benefits of integration may be diffuse and delayed, organizations should agree on indicators in advance, collect baseline data, and review results regularly with the teams that generate them, so that findings feed back into improvement rather than serving only as reports for external audiences.

9. IMPLICATIONS AND FUTURE DIRECTIONS

9.1 Implications for clinical practice and health system leaders

For clinical practice, the review suggests that integrating diagnostic services, therapeutic interventions, and patient-centered care requires deliberate design. Organizations should identify the points in their key pathways at which information, responsibility, or time is most likely to be lost, and target those points with specific mechanisms such as closed-loop result tracking, structured handoffs, and named care coordinators. Multidisciplinary case review should include those who perform and interpret diagnostic tests. Patients should be offered decision support and an active role in decisions, and their reports of problems should be incorporated into quality review (Giardina et al., 2018; Stacey et al., 2017). Social needs should be screened for and linked to action in partnership with community services (Fraze et al., 2019; Gurewich et al., 2020).

For leaders, a consistent message is that workload and well-being matter. Integration depends on people who have the time and energy to collaborate. Investments in digital infrastructure should be planned so that they reduce, rather than increase, the clerical burden on clinicians (Dyrbye et al., 2017).

9.2 Implications for education and policy

Education for integrated care should include interprofessional learning that gives students experience of working with other professions and with patients as partners. Training in communication, teamwork, and systems thinking is required, together with exposure to the work of diagnostic and community professionals. Continuing education should reach established clinicians whose habits of practice were formed in more siloed environments. For policy, reforms should align payment with coordinated care, mandate and enforce information sharing, support the workforce needed for multidisciplinary teams, and connect health and social care budgets and planning (McWilliams et al., 2018; WHO & UNICEF, 2018).

9.3 Implications for research

Several priorities for research emerge. Measures of fragmentation and integration need to be developed and validated so that progress can be tracked, ideally combining patient-reported and system data. Studies should specify and evaluate the components of complex interventions, so that effective elements can be identified (Baxter et al., 2018). Evaluations should be long enough to capture delayed effects and should include equity as an outcome, examining whether integration reduces or widens disparities. Research on diagnostic integration should measure diagnostic outcomes directly, an area in which evidence is currently sparse (Zwaan & Singh, 2020). Finally, implementation research should clarify why similar interventions succeed in some settings and fail in others, with attention to leadership, culture, workload, and policy context (Rawlinson et al., 2021).

10. LIMITATIONS

This review has limitations. As a narrative review, it does not follow a systematic protocol, and the selection and interpretation of sources involve judgment that may introduce bias. The restriction to 2017 to 2023 means earlier foundational work is addressed only indirectly. The literature is dominated by high-income settings, particularly the United States, the United Kingdom, and Europe, so the findings may not generalize to low- and middle-income countries where fragmentation takes different forms. Definitions of integration and fragmentation vary widely, which complicates synthesis. The qualitative ratings of evidence strength are interpretive. The proposed framework is a conceptual synthesis and has not been empirically tested.

11. CONCLUSION

Fragmentation is a persistent and multifaceted weakness of healthcare that affects diagnosis, treatment, and the experience of patients. Its structural, informational, relational, and temporal forms interact, which means that effective responses must operate at several levels simultaneously. The evidence reviewed shows that multidisciplinary teamwork, structured communication, care coordination, transitional care, shared decision making, and attention to social needs can improve care processes and patient experience, and that some of these strategies improve outcomes for particular groups. Effects on overall clinical outcomes and costs are less certain and depend heavily on implementation.

The framework proposed here offers a way to organize integrative efforts around the patient, through teams, within supportive organizations, and under enabling policy. The central message is that closing the fragmentation gap requires more than adding services or technology. It requires aligning roles, information, incentives, and relationships so that diagnostic services, therapeutic interventions, and patient-centered care operate as one system. Health systems that invest in these conditions, evaluate their efforts rigorously, and listen to the people they serve will be best placed to deliver care that is accurate, coherent, and humane.

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دمج الخدمات التشخيصية والتدخلات العلاجية والرعاية المتمحورة حول المريض: مراجعة سردية

الملخص

يُقوّض تشتّت الرعاية الصحية، أي انفصال الخدمات عبر مقدمي الرعاية ومواقع تقديمها والفترات الزمنية، دقة التشخيص واتساق العلاج وتجربة المرضى في تلقي الرعاية. تُجمّع هذه المراجعة السردية الأدبيات المنشورة بين عامي 2017 و2023 حول التشتّت والدمج، وتقترح إطارًا متعدد التخصصات لربط الخدمات التشخيصية والتدخلات العلاجية والرعاية المتمحورة حول المريض. وتُنظَّم النتائج موضوعيًا وتُقيَّم تقييمًا نوعيًا. تشير الأدلة إلى أن التشتّت ينشأ عن فجوات هيكلية ومعلوماتية وعلائقية وزمنية، ويسهم في تفويت التشخيص أو تأخره، وتكرار العلاج أو تعارضه، والضرر الذي يمكن تجنبه. وتُظهر نماذج الرعاية المتكاملة والعمل الجماعي بين التخصصات والتواصل المنظّم ورعاية الانتقال والمشاركة في اتخاذ القرار والاهتمام بالاحتياجات الاجتماعية فوائد لتجربة الرعاية وعملياتها، وإن كانت الآثار على النتائج السريرية والتكاليف متباينة. ويغطي الإطار المقترح مستويات المريض والفريق والمؤسسة والسياسة. وتُناقش الآثار المترتبة على الممارسة والتعليم والسياسة والبحث، مع التأكيد على القياس والإنصاف. وتُبرز تعددية الأمراض والانتقالات بين مستويات الرعاية والاحتياجات الاجتماعية غير الملبّاة بوصفها مجالات ذات أولوية.

الكلمات المفتاحية :تشتّت الرعاية؛ الرعاية المتكاملة؛ الفرق متعددة التخصصات؛ الرعاية المتمحورة حول المريض؛ تنسيق الرعاية