Interprofessional Strategies to Prevent Missed and Delayed Diagnoses—A Scoping Review

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ABSTRACT

Background: Missed and delayed diagnoses can arise when investigation results, specialist referrals, and unresolved symptoms do not receive appropriate follow-up. Interprofessional coordination may support continuity across these diagnostic activities.

Objective: To map interprofessional strategies intended to close diagnostic loops and describe their components, reported outcomes, implementation barriers, and facilitators.

Methods: The proposed scoping review will follow JBI methodology and PRISMA-ScR reporting guidance. PubMed, Embase, CINAHL, and Scopus will be searched from inception to the final search date. Eligible English-language empirical reports will describe at least two healthcare professions coordinating a diagnostic task. Two reviewers will independently screen records. Data will undergo descriptive summarisation and qualitative content analysis, distinguishing process measures from diagnostic and patient outcomes.

Results: In the simulated selection process, 1,248 records were identified, 962 underwent screening after deduplication, and 74 reports received full-text assessment. Twenty-four reports representing 22 unique studies were included. Ownership and accountability appeared in 14 studies (63.6%), communication and escalation in 12 (54.5%), and tracking and navigation in 10 (45.5%). Eighteen studies primarily measured process outcomes, while four measured missed or delayed diagnoses directly. Illustrative implementation themes included unclear responsibilities, fragmented information systems, workload pressures, and difficulties contacting patients.

Conclusion: The simulated evidence map illustrates how interprofessional responsibility, communication, tracking, and patient involvement could be examined across diagnostic pathways. It does not establish intervention effectiveness. A completed

review is required to verify these patterns and assess the distinction between improved follow-up and better diagnostic outcomes.

Keywords: Diagnostic safety; delayed diagnosis; interprofessional collaboration; diagnostic follow-up; scoping review.

1.INTRODUCTION

Missed and delayed diagnoses remain important concerns in patient safety because they can postpone appropriate treatment and leave patients without a clear explanation for their symptoms. Diagnosis develops through several connected activities, including clinical assessment, investigation, interpretation, communication, and reassessment. These activities often involve different professionals and healthcare settings. Consequently, diagnostic safety depends on both clinical reasoning and the reliable coordination of information and responsibilities. The National Academies of Sciences, Engineering, and Medicine (NASEM, 2015) describes diagnosis as a collaborative process involving patients, families, and healthcare professionals working within a wider clinical system. This perspective provides a foundation for examining how interprofessional practice can support timely diagnosis.

One important challenge is ensuring that diagnostic activities lead to an appropriate response. Ordering an investigation does not guarantee that it will be completed, and receiving a result does not establish that it has been interpreted or acted upon. Similarly, a specialist referral may remain incomplete, while persistent symptoms may require reassessment even after an initially reassuring investigation. The Centers for Disease Control and Prevention (CDC, 2026) identifies appropriate test ordering, interpretation, communication, and action as central components of diagnostic excellence. For this review, closing the diagnostic loop refers to a traceable process through which an identified diagnostic concern receives an appropriate, documented response and follow-up plan.

Interprofessional collaboration is relevant throughout this process. Nurses may identify changes in patients' conditions and communicate unresolved concerns. Laboratory and imaging professionals contribute information needed for diagnostic interpretation, while pharmacists can help identify medication-related explanations for symptoms. Their contributions complement those of clinicians responsible for diagnostic decisions, although specific responsibilities vary across settings and professional scopes of practice. NASEM (2015) emphasises that these professionals support diagnosis through interconnected tasks. Examining how those tasks are coordinated can therefore provide a more useful understanding of diagnostic safety than considering each profession separately.

Patients and caregivers also have an important role in maintaining continuity across the diagnostic pathway. They need understandable information about results, planned investigations, referral arrangements, and the circumstances in which further assessment is required. The World Health Organization (WHO, 2024) recommends involving patients in diagnostic decision-making, sharing information across disciplines, and establishing reliable referral and follow-up processes. These recommendations suggest that loop closure should encompass communication with patients as well as exchanges between professionals. A result that reaches a clinical inbox may still leave the patient uncertain about its meaning or the next action.

Research provides examples of approaches to improving diagnostic follow-up. Atlas et al. (2023) found that a multilevel intervention combining electronic health record reminders with patient outreach, with or without navigation, improved completion of overdue follow-up after abnormal cancer screening results. However, follow-up completion is a process outcome and should be distinguished from a demonstrated reduction in missed diagnoses or patient harm. This distinction is important when interpreting studies that evaluate different stages of diagnostic care.

Existing reviews also provide a basis for further investigation. Li et al. (2026) examined diagnostic stewardship mechanisms in electronic test-result management and highlighted the interaction between technical systems and organisational practices. Building on this work, the present review will examine interprofessional responsibility across test results, referrals, and unresolved symptoms, including digital and non-digital strategies. Its intended contribution is to connect the professions involved, the diagnostic stages addressed, and the outcomes measured.

Accordingly, this scoping review aims to map interprofessional strategies intended to close diagnostic loops and describe their components, implementation contexts, reported outcomes, barriers, and facilitators. It will distinguish improvements in communication and task completion from directly measured diagnostic benefits and identify areas requiring further investigation.

2.METHODS

This scoping review will map interprofessional strategies intended to close diagnostic loops involving investigation results, specialist referrals, and unresolved symptoms. The review will follow JBI methodological guidance and will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews, PRISMA-ScR (Peters et al., 2020; Tricco et al., 2018). A protocol will be finalised before formal screening and deposited in an accessible repository. Subsequent amendments will be documented and justified.

Eligibility will follow the population, concept, and context framework. Studies involving patients of any age will be eligible when at least two distinct healthcare professions participate in an explicitly coordinated diagnostic task. Primary quantitative, qualitative, mixed-methods, and quality-improvement studies will be considered across hospital, primary, emergency, outpatient, dental, and community settings. English-language full reports will be included. Reviews, editorials, protocols, education-only simulations, and studies without an interprofessional diagnostic component will be excluded.

PubMed, Embase, CINAHL, and Scopus will be searched from inception to the final search date. Searches will combine controlled vocabulary and keywords relating to diagnostic errors, delayed diagnosis, test results, referrals, interprofessional collaboration, follow-up, and loop closure. An information specialist will assist with developing and checking the strategy. Reference lists and forward citations of included studies will be examined, alongside predefined institutional sources for empirical evaluation reports. Exact strategies, platforms, dates, and retrieved counts will be retained.

After deduplication, two reviewers will independently screen titles and abstracts, followed by potentially eligible full texts. Criteria will be piloted before screening. Disagreements will be resolved through discussion or consultation with a third reviewer. Full-text exclusion reasons and unsuccessful retrieval attempts will be recorded separately. Companion publications will be linked to prevent double counting.

A piloted extraction form will capture study characteristics, professional roles, diagnostic stages, intervention components, responsibility arrangements, patient involvement, outcome definitions, and implementation findings. One reviewer will extract information, and a second will verify all entries against the original reports. Missing information will be labelled as not reported.

Descriptive summaries and basic qualitative content analysis will map strategies, contexts, barriers, and facilitators. Outcome categories will distinguish acknowledgment, completed diagnostic actions, diagnostic timeliness or accuracy, and patient outcomes. No meta-analysis or formal risk-of-bias assessment is planned because the purpose is evidence mapping rather than comparative effectiveness. This limitation will inform interpretation. Study selection will be presented in a PRISMA flow diagram, with evidence tables summarising unique studies and their reported findings.

3.RESULTS

In this simulated review, searches identified 1,248 records: 1,180 from electronic databases and 68 from supplementary searches. After removing 286 duplicates, 962 records underwent title and abstract screening. Of these, 882 were excluded, leaving 80 reports sought for full-text retrieval. Six reports could not be retrieved.

The remaining 74 reports were assessed against the eligibility criteria. Fifty were excluded, most commonly because they lacked an explicit interprofessional diagnostic process. Ultimately, 24 reports describing 22 unique studies were included. Two reports were companion publications linked to studies already represented in the review.

Table 1. Simulated record counts for the study-selection process

Selection stage	Records or reports, n
Records identified through databases	1,180
Records identified through supplementary searches	68
Total records identified	1,248
Duplicate records removed	286
Records screened by title and abstract	962

Records excluded during initial screening	882
Reports sought for retrieval	80
Reports not retrieved	6
Full-text reports assessed	74
Full-text reports excluded	50
— No qualifying interprofessional process	21
— No diagnostic-loop focus	14
— Ineligible publication type	9
— Education-only setting	4
— Ineligible language	2
Reports included	24
Unique studies represented	22

Note. Records are search entries; reports are documents; unique studies are the underlying investigations. Companion publications do not increase the number of unique studies.

The 22 simulated studies were assigned identifiers S01–S22. Primary care was the most frequently represented setting, followed by hospital care. Quantitative evaluations predominated, although qualitative and mixed-methods studies also contributed information about implementation.

Test-result follow-up was the principal diagnostic focus in 14 studies, referral completion in five, and reassessment of unresolved symptoms in three. Each study was assigned one principal setting, design, and diagnostic focus for descriptive counting.

Table 2. Simulated characteristics of the 22 unique studies

Characteristic	Category	Studies, n	Percentage
Setting	Primary care	9	40.9%
	Hospital inpatient or specialist care	7	31.8%
	Emergency care	4	18.2%
	Community care	2	9.1%
Study design	Randomised controlled trial	3	13.6%
	Quasi-experimental evaluation	7	31.8%
	Observational study	5	22.7%
	Qualitative study	4	18.2%
	Mixed-methods study	3	13.6%
Principal diagnostic focus	Test-result follow-up	14	63.6%
	Referral completion	5	22.7%
	Unresolved-symptom reassessment	3	13.6%

Note. Percentages use 22 unique studies as the denominator. Small differences from 100% reflect rounding.

Six strategy domains were represented in the simulated evidence map. Explicit ownership and accountability were the most frequently identified components. These approaches assigned responsibility for reviewing findings, arranging further assessment, and providing backup when the designated professional was unavailable.

Communication and escalation approaches included acknowledgment of important findings, defined

routes for unresolved concerns, and confirmation that responsibility had transferred between professionals. Tracking and navigation approaches addressed pending investigations, incomplete referrals, and patients requiring additional contact.

Table 3. Simulated distribution of interprofessional strategy components

Strategy domain	Illustrative components	Studies, n	Percentage
Ownership and accountability	Named task owner, backup arrangements, documented responsibility transfer	14	63.6%
Communication and escalation	Acknowledgment, urgency-based escalation, referral feedback	12	54.5%
Tracking and navigation	Pending-task registers, referral tracking, patient outreach	10	45.5%
Shared diagnostic review	Joint case discussions and laboratory or imaging consultation	8	36.4%
Patient partnership	Accessible explanations, agreed follow-up plans, symptom reporting	7	31.8%
Learning and organisational support	Audit feedback, workflow training, protected follow-up time	5	22.7%

Note. Multiple domains could occur within one study; counts and percentages therefore exceed the total when added.

In this example, most studies concentrated on intermediate processes. Eighteen studies primarily examined completion, timeliness, or acknowledgment of diagnostic activities. Four primarily measured missed or delayed diagnoses directly.

This distribution illustrates why outcome definitions should remain explicit. A higher acknowledgment rate describes information receipt, whereas completion of further investigation describes a later stage of care. Neither endpoint alone establishes that diagnostic errors or patient harm were reduced.

Table 4. Simulated classification by principal outcome

Principal outcome	Illustrative measurement	Studies, n	Percentage
Follow-up completion	Proportion completing the recommended investigation or referral	8	36.4%
Follow-up timeliness	Time from an abnormal finding to documented clinical action	6	27.3%
Result acknowledgment	Proportion of results acknowledged by the responsible professional	4	18.2%
Missed or delayed diagnosis	Diagnostic errors identified using a defined assessment procedure	4	18.2%
Total		22	100.0%

Note. Each simulated study contributes once according to its principal outcome. These figures describe hypothetical measurement patterns, not intervention effectiveness.

The simulated qualitative synthesis identified unclear responsibility, fragmented information systems, competing workload, and difficulty contacting patients as potential implementation barriers. Proposed facilitators included backup arrangements, accessible communication, integrated tracking, and regular feedback on incomplete diagnostic tasks.

These themes demonstrate how the final Results section could connect intervention components with implementation conditions. In the actual review, every theme and numerical statement should be traceable to the extraction records and supporting included studies.

4.DISCUSSION

The simulated evidence map illustrates how diagnostic loop closure could be examined through professional responsibility, communication, tracking, and patient involvement. Ownership and accountability were the most frequently represented components in the example. However, their frequency cannot establish their effectiveness or importance relative to other strategies. In a completed review, this pattern would justify examining how responsibilities were allocated, whether backup arrangements existed, and how teams confirmed that the required action had occurred. The CDC's diagnostic-excellence framework supports attention to these organisational processes by emphasising appropriate interpretation, communication, and action on diagnostic findings (Centers for Disease Control and Prevention [CDC], 2024).

A central issue is the relationship between shared responsibility and individual accountability. Several professionals may contribute to a diagnostic pathway, but the next action still requires a clearly identified owner. For example, communicating an abnormal result does not establish that further investigation has been arranged. Likewise, transferring a referral does not confirm that the receiving service has accepted responsibility. The hypothetical prominence of ownership and escalation strategies therefore provides a useful basis for investigating how teams manage transitions between tasks. Any practical recommendations would need to be supported by the actual included studies and their implementation contexts.

Technology should also be considered alongside the work required to use it. Li et al. (2024) identified both technical and non-technical mechanisms in electronic test-result management, including approaches related to workload, follow-up responsibilities, education, and feedback. Their findings provide context for examining whether tracking systems are supported by adequate staffing and workable procedures. A registry may make incomplete tasks visible, but its usefulness depends on whether someone reviews those tasks and can arrange the necessary response. The simulated strategy categories illustrate this interaction without demonstrating that any particular combination produces better outcomes.

The distinction between process outcomes and diagnostic outcomes deserves particular attention. In the simulated dataset, most studies primarily measured acknowledgment, timeliness, or follow-up completion. These measures describe important stages of care, but they do not independently establish reductions in missed diagnoses or patient harm. Actual research demonstrates the relevance of this distinction: Atlas et al. (2023) found that electronic reminders combined with patient outreach, with or without navigation, improved completion of overdue follow-up after abnormal cancer screening results. This finding supports a specific follow-up intervention in its studied context; it should not be extended automatically to other diagnostic pathways or outcomes.

Patient participation provides another dimension of loop closure. Patients need to understand why an investigation or referral is necessary, what happens next, and when persistent or worsening symptoms require reassessment. WHO (2024) recommends accessible communication, patient involvement, and clear information about warning signs. These recommendations suggest that evaluating communication should extend beyond whether a message was sent. Future evaluations could examine patient understanding, ability to obtain follow-up, and barriers related to language or digital access. Responsibility for maintaining diagnostic continuity should nevertheless remain supported by the healthcare system.

The hypothetical concentration on test-result follow-up also illustrates a potential question for further research: whether referral completion and unresolved symptoms receive comparable attention. Such an imbalance, if demonstrated through a completed search, would identify a gap within the review's coverage. It would not establish that these areas are neglected everywhere. Similarly, findings from primary care or hospital settings would require careful assessment before being applied to emergency, dental, community, or rehabilitation services.

The principal limitation of this illustrative discussion is that its underlying study counts and themes are simulated. Consequently, they cannot support empirical conclusions, estimates of effectiveness, or clinical recommendations. A completed review would also need to consider search coverage, language restrictions, inconsistent definitions of closure, overlapping reports, and variation in outcome measurement. Future research priorities should emerge from that verified evidence map, with particular attention to clearly defined responsibilities, directly measured diagnostic outcomes, patient experience, and the resources required to sustain follow-up.

5.CONCLUSION

This illustrative review highlights how interprofessional strategies could support diagnostic continuity through clear responsibility, coordinated communication, reliable tracking, and patient involvement. Closing the diagnostic loop requires more than delivering or acknowledging information; it involves ensuring that an appropriate response occurs and that unresolved concerns receive further assessment.

The simulated evidence map also demonstrates the importance of distinguishing improved follow-up processes from reductions in missed or delayed diagnoses. Acknowledgment, referral completion, and timely action are relevant measures, but their improvement alone does not establish better diagnostic outcomes.

Because the presented results are simulated, they cannot establish intervention effectiveness or support clinical recommendations. A completed scoping review is needed to verify these patterns and identify evidence gaps. Future evaluations should examine directly measured diagnostic outcomes, patient understanding, implementation resources, and the sustainability of coordination across professions and care settings

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