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NURSING CONTRIBUTIONS TO DIAGNOSTIC SAFETY: CLINICAL SURVEILLANCE, COMMUNICATION, AND PREVENTION OF DIAGNOSTIC ERROR

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ABSTRACT-

Telehealth monitoring is a chance to use routinely collected clinical and behavioral data to identify patients at higher risk for short-term health outcomes. This study assessed the association of demographic, physiological, behavioral, and healthcare-utilization indicators with 30-day high-risk status in a telehealth monitoring dataset. The secondary analytical observational design comprised 1,800 patient records of adult patients with complete data on age, sex, BMI, blood pressure, resting heart rate, daily steps, medication adherence, sleep duration, prior hospital admissions and risk status within 30 days. Descriptive statistics, Mann–Whitney U test, Fisher's exact test, Spearman correlation and binary logistic regression were used. There was significant class imbalance as only 14 patients were identified as high risk within 30 days. The high-risk individuals had an older age profile, higher diastolic blood pressure, higher resting heart rate, lower daily step count and poorer medication adherence. Logistic regression also found positive age, DBP, and RHR association with short-term risk, while daily steps and medication adherence had inverse associations with short-term risk. Correlations between most predictors were low, indicating that predictors were complementary aspects of the health status. These findings suggest that combining clinical and behavioral measures could enhance short term risk assessment for telehealth monitoring. However, the high-risk group is small, which limits the stability of estimates. Longitudinal data sets are needed to be larger, and external validation is required prior to clinical implementation.

Keywords: Telehealth monitoring; Short-term health risk; Clinical indicators; Behavioral indicators; Logistic regression

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1. Introduction

Diagnostic safety is a crucial element of quality health care as the quality and timeliness of diagnosis will influence the subsequent quality of treatment, monitoring and clinical decision making. Diagnostic errors might include failure to diagnose, failure to diagnose at all, failure to diagnose promptly, misdiagnosis and can happen anywhere in the diagnostic workflow, from assessment and interpretation of clinical data, through to communication, follow-up and re-assessment. These mistakes may lead to incorrect care, extended sickness, avoidable complications, greater use of healthcare facilities and harm to the patient. So the accuracy of the diagnosis is not only related to personal clinical skills but also to an appropriate information collection, communication, team working and the organization process. A systematic review of diagnostic challenge and patient safety has highlighted the need to leverage coordinated strategies to tackle both clinical and system-level factors in enhancing diagnostic accuracy, instead of perceiving diagnostic error as an individual practitioner problem (Alharbi et al., 2025).

The clinical significance of diagnostic error is illustrated in hospital studies, which show that diagnostic error is a significant issue, especially for patients who are seriously deteriorating. In hospitalized adults who either died or were transferred to intensive care, diagnostic errors have been identified, suggesting that some of these errors may occur at an earlier stage of routine care. These findings underscore the need for continuous evaluation and prompt reassessment of clinical changes, as well as rapid escalation when clinical findings do not align with the diagnosis or prognosis (Auerbach et al., 2024). Diagnostic errors are complex and can be attributed to cognitive deficits, incomplete information, communication breakdown, lack of follow up, system failures or a combination of these factors. Thus, diagnostics safety should be a concerted effort, with various members of the health care team giving information and observations along the patient's clinical pathway (Vally et al., 2023).

Because of their constant and intimate contact with patients, nurses are uniquely positioned to contribute to diagnostic safety. They are tasked with ongoing assessments, vital signs and symptoms monitoring, noticing changes in clinical status, documentation, communication with other professionals and escalation of concern. It is possible that, during these activities, the nurse will see signs of deterioration, inconsistencies of the clinical picture, unexpected responses to treatment, and new signs and symptoms, which may lead to reconsideration of the current diagnosis. In the context of medical error prevention, the focus has shifted to a system-based approach, effective teamwork, clear communication, standardized procedures, and early detection of potential safety risks, which all relate to regular practice for nurses (Rodziewicz et al., 2024).

In work environments where there are staffing shortages, resource restrictions, or gaps in communication or skill training, particularly among professionals, the role of nursing in diagnostic safety becomes a critical focus. The need for proper education, safety focused organizational

practices and increased involvement of healthcare providers in error prevention in developing and resource limited healthcare systems also highlight the importance of patient safety (Al-Worafi, 2023). Thus, nurses can be a part of providing bedside care and also serve as a valuable source of diagnostic data and as a protective barrier against missed opportunities for diagnosis.

This potential has not been explicitly investigated as much as physicians' diagnostic decision-making. Increased emphasis on nursing surveillance, communication, escalation, and patient engagement could lead to a more comprehensive understanding of how to prevent diagnostic errors. This review thus focuses on nursing contributions to diagnostic safety, with an emphasis on clinical surveillance, communication and interprofessional collaboration, preventing missed or delayed diagnosis, involving patients and families, and ways to enhance nursing involvement in safer diagnostic processes.

Objectives

- To examine the contribution of nursing clinical surveillance and continuous patient assessment to early recognition of diagnostic problems and clinical deterioration.
- To evaluate the role of nursing communication and interprofessional collaboration in supporting accurate, timely, and safe diagnostic processes.
- To identify nursing strategies, barriers, and future opportunities for preventing diagnostic errors and strengthening diagnostic safety in clinical practice.

2. Diagnostic Safety and Diagnostic Error in Clinical Practice

2.1 Concept of Diagnostic Safety

Diagnostic safety is the ability to obtain an accurate and timely understanding of a patient's health problem in a way that reduces preventable harm that can be caused by missed, delayed or incorrect diagnoses. It is present throughout the entire diagnostic process, from assessment to investigation, interpretation, communication, reassessment and follow-up. Furthermore, diagnostic errors do not necessarily happen because of just one single error, but rather because of a series of process failures, and the need for coordinated clinical reasoning and teamwork is essential to make diagnosis safer (Griffin et al., 2022). Patients and health care professionals might also perceive various vulnerable aspects of the diagnostic procedure, showing that diagnostic safety is a joint responsibility of clinical teams and patients (Schnock et al., 2022).

2.2 Types and Patterns of Diagnostic Error

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Missed, delayed and wrong diagnoses are all common types of diagnostic error. These may be due to insufficient assessment, early diagnostic statements, unusual presentations, misinterpretation of investigations or inadequate re-assessment. The distribution of errors may differ from specialty to specialty. Overlapping symptoms, changing presentations, and the lack of objective diagnostic tests can lead to missed or incorrect diagnoses in mental health care settings, highlighting the need for ongoing assessments and thoughtful clinical analysis (Bradford et al., 2024).

2.3 Contributing Factors to Diagnostic Error

Diagnostic error typically is multifactorial and can include human, organizational, and system-level deficiencies. In emergency care, contributing factors are information gathering, interpretation, decision-making and communication failure or difficulties, many of which occur under circumstances of time constraint and high workload (Baartmans et al., 2022). Other studies in the hospital environment have also reported lack of communication, insufficient documentation, lack of follow-up, and coordination issues as recurring factors. This sheds light on the need for a systems-based approach as these errors can be attributed to a series of interrelated failures and not necessarily a single clinician or decision (Hooftman et al., 2024). The major forms of diagnostic error and their contributing factors are summarized in Table 1.

Table 1. Major Forms and Contributing Factors of Diagnostic Error

Diagnostic safety issue	Description	Common contributing factors	Potential consequence	References
Missed diagnosis	A clinically important condition is not identified during assessment	Incomplete information, failure to recognize symptoms, premature closure	Delayed treatment and disease progression	(Griffin et al., 2022)
Delayed diagnosis	Correct diagnosis is established later than clinically appropriate	Delayed reassessment, poor follow-up, communication gaps	Clinical deterioration and prolonged hospitalization	(Neilson et al., 2023)

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Incorrect diagnosis	Symptoms or findings are attributed to the wrong condition	Cognitive errors, atypical presentation, misinterpretation of findings	Inappropriate or unnecessary treatment	(Bradford et al., 2024)
Process-related diagnostic error	Error develops across multiple stages of the diagnostic pathway	Poor coordination, documentation gaps, inadequate information transfer	Repeated missed opportunities for correction	(Hooftman et al., 2024)
Human-factor-related error	Diagnostic failure associated with individual and environmental factors	Workload, interruptions, time pressure, decision-making limitations	Increased risk of preventable harm	(Baartmans et al., 2022)

2.4 Clinical Consequences of Diagnostic Error

Diagnostic errors may result in a delay in diagnosis, or in preventable complications, increased length of stay, deterioration, disability, or death. In conditions such as sepsis which are time sensitive, the risk is even greater that the recognition will be delayed, thus delaying provision of necessary escalation of care and treatment. Medico-legal claims have identified several potential causes of delayed diagnosis which include missed deterioration, inadequate re-assessment, communication issues, and lack of incorporation of evolving clinical information (Neilson et al., 2023). These effects emphasize the need for ongoing monitoring and communication during the patient care journey – especially when symptoms change or treatment outcomes are not as anticipated. The nursing contribution to diagnostic safety can be broadly organized into clinical surveillance, communication and collaboration, and prevention of diagnostic error, as illustrated in Figure 1.

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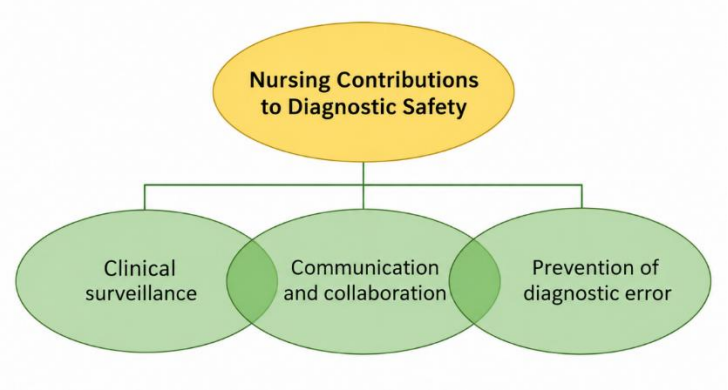


Figure 1. Nursing Contributions to Diagnostic Safety

3. Nursing Role in Clinical Surveillance

3.1 Continuous Patient Assessment

Clinical surveillance is a key nursing role which includes the continuous gathering, understanding and re-evaluating of patient information. Often, nurses are the professionals that are closest and in most continuous contact with patients and therefore may be the first to notice subtle changes that may not be observed during more intermittent medical review. The nursing surveillance involves checking vital signs, symptoms, behaviour, response to treatment and clinical course. The concept of nursing surveillance has been explored in research, which has demonstrated its strong association with patient safety, as early detection of abnormal changes can aid in timely intervention and minimize the risk of patient deterioration (Doyon & Raymond, 2024; Panahi, 2025)

3.2 Recognition of Clinical Deterioration

In certain instances, such as when symptoms are changing quickly or when the primary diagnosis is inconclusive about the clinical picture, the capacity to recognize changes in the patient's condition is essential. Nurses can identify the signs and symptoms of deterioration – for example, changes in levels of consciousness, breathing, circulation, pain, mobility or function – that should be investigated further or escalated. Nurses in this position will also find this role useful in a remote or telehealth environment, where they are required to understand only a limited amount of information in the clinical setting and decide if a patient needs immediate evaluation. It is well recognised from teletriage practice that structured clinical judgment, clear communication and appropriate escalation is essential to ensure patient safety (Haimi & Wheeler, 2024).

3.3 Technology-Supported Surveillance

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The applications of digital technologies are growing increasingly to allow continuous nursing surveillance. The use of wearable devices and IoT-based systems can ensure continuous monitoring of vital signs and other physiological parameters, allowing healthcare professionals to identify abnormalities at an early stage, which is difficult to achieve through intermittent monitoring alone. Smart nursing systems can also facilitate the collection, remote monitoring, and real-time reporting of patient conditions, enhancing the nurses' ability to recognize changes in various care settings (Wang et al., 2024).

A patient monitoring system is also being used to integrate artificial intelligence and deep learning to detect deterioration or disease progression patterns. These technologies can aid the nurse by analysing vast amounts of clinical data and flagging possible changes of significance but should not be used as a substitute for nursing judgment (Alharbe & Almalki 2025). Likewise, the use of predictive models with IoT has been found to be useful in remote monitoring and early risk detection, suggesting how digital surveillance can aid in timely clinical assessments and diagnostic support (Alzakari et al., 2024). The main nursing surveillance activities and their contributions to diagnostic safety are presented in Table 2.

Table 2. Nursing Clinical Surveillance and Its Contribution to Diagnostic Safety

Nursing surveillance activity	**Diagnostic safety contribution**	**Clinical application**	**References**
Continuous patient assessment	Detects subtle changes that may indicate an evolving or incorrect diagnosis	Monitoring symptoms, vital signs, behaviour, and treatment response	(Doyon & Raymond, 2024)
Recognition of deterioration	Supports early reassessment and escalation of care	Identification of worsening respiratory, neurological, circulatory, or functional status	(Haimi & Wheeler, 2024)
Wearable monitoring	Enables continuous collection of physiological information	Remote vital-sign monitoring and early abnormality detection	(Taherdoost, 2024)

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Smart nursing systems	Improves real-time access to patient information	Automated monitoring, alerts, and communication of clinical changes	(Wang et al., 2024)
AI-supported surveillance	Assists in identifying complex patterns associated with clinical risk	Early warning and diagnostic support using patient-monitoring data	(Alharbe & Almalki, 2025)
Predictive remote monitoring	Supports early identification of high-risk conditions	IoT-enabled prediction and remote clinical surveillance	(Alzakari et al., 2024)

Overall, nursing surveillance combines direct observation, clinical reasoning, communication, and increasingly, technology-assisted monitoring. Its contribution to diagnostic safety lies in the early recognition of unexpected changes and the timely escalation of concerns when a patient's condition no longer matches the expected clinical course. Nursing surveillance combines continuous assessment, clinical judgment, recognition of deterioration, and timely escalation to support the early identification of diagnostic problems, as summarized in Figure 2.

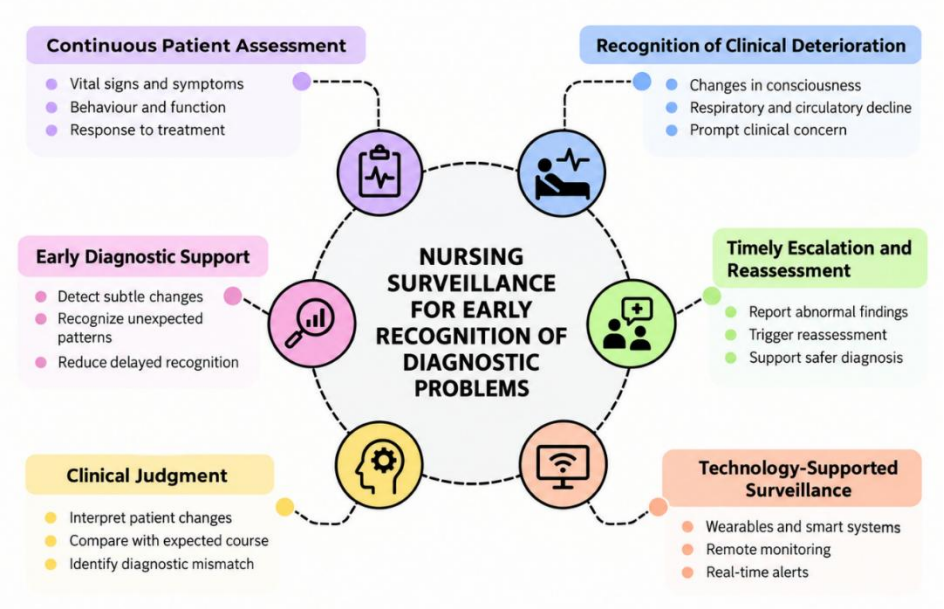


Figure 2. Nursing Surveillance for Early Recognition of Diagnostic Problems

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4. Communication and Interprofessional Collaboration

4.1 Nurse–Physician Communication

Communication between the nurse and the physician plays a crucial role in diagnostic safety because the nurse is likely to be the first to detect changes in patient status. Prompt reporting of abnormal results, failure to respond to treatment, and development of new symptoms can help with a reassessment and shorten delays in diagnosis. Lack of communication during handover can lead to the loss of critical patient information and can result in avoidable patient harm, especially if concern is not well communicated among healthcare providers (Atinga et al., 2024).

4.2 Teamwork and Shared Clinical Reasoning

When nurses are engaged in team-based clinical reasoning and decision-making, diagnostic safety is enhanced. In high-risk environments like hospital intensive care units, good teamwork can facilitate coordination among various professionals and aid in the timely identification of patients' evolving requirements (Chen & Gong, 2022). Additionally, interprofessional communication training has been linked to better teamwork and fewer preventable adverse events, highlighting the importance of structured communication in enhancing patient safety (Hüner et al., 2023).

4.3 Communication of Diagnostic Uncertainty

Communication is particularly crucial if the diagnosis is not certain. Nurses can assist in communicating to other patients' symptoms, concerns, and responses that need to be addressed. Structured approaches to communicating diagnostic uncertainty can enhance transparency and ensure that issues of diagnostic uncertainty are kept on the radar when someone is cared for and followed up (Khazen et al., 2023).

4.4 Patient Communication and Shared Information

Patients can also play a significant role in the diagnosis by helping identify symptoms, inconsistencies or changes that might not have been fully documented in their clinical records. Shared visit notes can also help patients to be involved in identifying diagnostic safety issues and potential “good catches” and thus provide an extra layer of protection against missed information (Bell et al., 2022). While digital tools and artificial intelligence play an increasing role in healthcare, communication with patients is also crucial. When implementing AI-assisted diagnostics in clinical practice, patients have stressed the importance of transparency, comprehension, and maintaining the human touch in the process (Foresman et al., 2025). The key communication pathways that support diagnostic safety are outlined in Table 3.

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Table 3. Communication Pathways Supporting Diagnostic Safety

Communication pathway	**Nursing contribution**	**Diagnostic safety benefit**	**References**
Nurse–physician communication	Reports abnormal findings, new symptoms, and treatment non-response	Promotes timely reassessment and reduces missed information	(Atinga et al., 2024)
Interprofessional teamwork	Integrates nursing observations into multidisciplinary decisions	Improves coordination and shared clinical reasoning	(Chen & Gong, 2022)
Structured communication training	Strengthens clarity and consistency of information exchange	Reduces communication-related adverse events	(Hüner et al., 2023)
Communication of uncertainty	Maintains visibility of unresolved diagnostic concerns	Encourages reassessment and follow-up	(Khazen et al., 2023)
Patient participation	Allows patients to identify omissions or inconsistencies in care	Creates an additional safeguard against diagnostic error	(Bell et al., 2022)
AI-related diagnostic communication	Helps patients understand technology-supported diagnostic processes	Supports transparency and trust in diagnostic decision-making	(Foresman et al., 2025)

Overall, effective diagnostic communication depends on timely information exchange among nurses, physicians, patients, and other healthcare professionals. Strong interprofessional collaboration helps ensure that changes in clinical status, diagnostic uncertainty, and unresolved concerns are communicated clearly enough to support appropriate reassessment and action. Effective diagnostic safety depends on communication across nurses, physicians, multidisciplinary

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teams, and patients. The principal communication pathways supporting this process are presented in Figure 3.

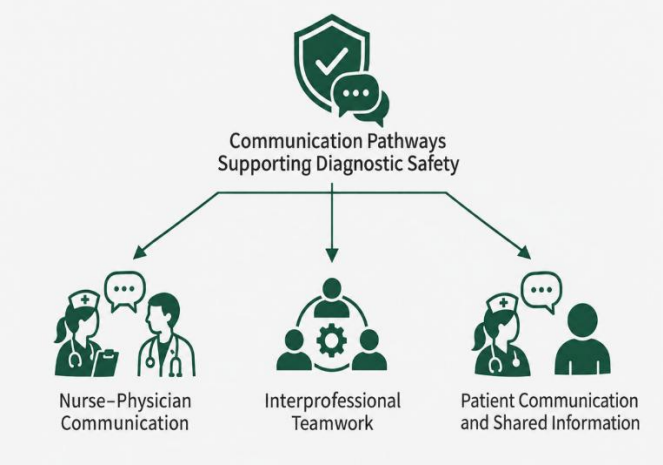


Figure 3. Communication Pathways Supporting Diagnostic Safety

5. Nursing Contributions to the Prevention of Diagnostic Error

5.1 Early Recognition and Prevention of Missed Diagnosis

One way to prevent missed and delayed diagnosis is to continually assess whether the patient's symptoms and clinical course(s) are still compatible with the diagnosis, and whether the response to treatment is what is expected for the diagnosis. Repeat evaluation and escalation if new symptoms or ongoing abnormalities or unexpected deterioration. The concept of diagnostic stewardship helps guide the use and interpretation of diagnostic tests while minimizing errors associated with unnecessary, inappropriate or poorly followed up investigations (Morgan et al., 2023). Other wider diagnostic excellence frameworks also highlight the need for coordinated processes, timely follow-up and shared responsibility across the healthcare team as a foundation for increased nursing involvement in diagnostic safety (Morgan et al., 2025).

5.2 Follow-Up of Clinical and Diagnostic Information

Good documentation and follow-up of lab results, imaging, referrals, and unfixed clinical concerns are essential to stop diagnostic error. Nurses can make a difference when they identify that something is not as it should be, ensure the correct information is conveyed to the right clinician and look for inconsistencies between documented results and actual subsequent clinical activity. While the process can be complemented using electronic health records, effective implementation and utilization in clinical practice are crucial to ensure the system's effectiveness (Chimbo & Motsi, 2024; Shamim, 2022)

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5.3 Technology-Assisted Error Prevention

Digital monitoring and telemedical technologies can improve nursing surveillance and provide constant and/or remote data on patient status. The systems of IoMT with AI can enable real-time data collection and help healthcare professionals quickly detect abnormalities that could indicate the need for additional diagnostic testing (Aljabr & Kumar, 2022). Decision-support systems are also able to incorporate various clinical data sources and provide warnings or suggestions, which help healthcare workers spot potential risks but must be interpreted by the practitioner and not taken as gospel (Almadani et al., 2025).

5.4 Clinical Judgment in Technology-Supported Diagnosis

AI holds progressively great promise for aiding with diagnostic procedures, recognizing patterns in intricate clinical datasets, and helping to detect diseases at an earlier stage. Diagnostic technologies should be used in conjunction with, not in place of, professional assessment, communication, and clinical reasoning, however. The role of the nurse in the interpretation of information generated by the technology in the context of the broader clinical picture of the patient remains very important to identify discrepancies, to raise concerns and to relay information to the diagnostic team. Thus, it is crucial to integrate AI with human oversight and decision-making processes (Kuo, 2023). The principal nursing strategies used to prevent diagnostic error are summarized in Table 4.

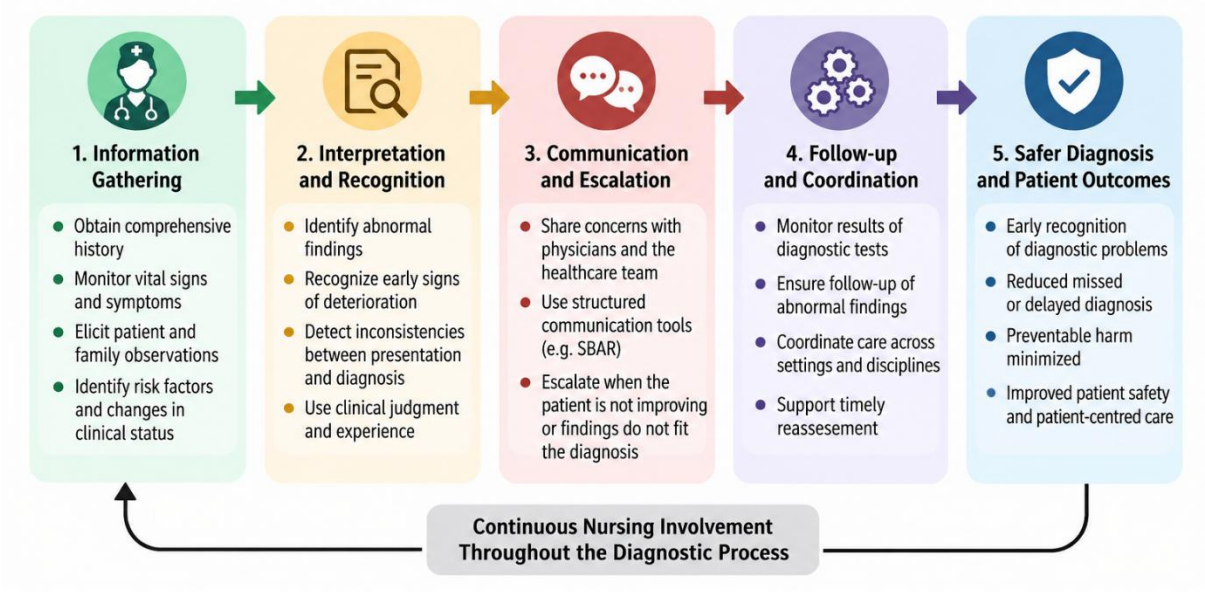


Figure 4. Nursing Contributions Across the Diagnostic Process

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Nursing involvement extends across the diagnostic process, from gathering and interpreting patient information to communicating concerns, escalating changes, coordinating follow-up, and supporting safer diagnostic outcomes, as illustrated in Figure 4.

Table 4. Nursing Strategies for Prevention of Diagnostic Error

Nursing strategy	Application	Contribution to error prevention	References
Diagnostic stewardship	Supports appropriate diagnostic testing and follow-up	Reduces inappropriate, unnecessary, or missed diagnostic investigations	(Morgan et al., 2023)
Diagnostic excellence practices	Promotes shared responsibility and coordinated diagnostic processes	Strengthens timely identification and correction of diagnostic problems	(Morgan et al., 2025)
Electronic documentation	Improves accessibility and continuity of clinical information	Reduces information loss and supports follow-up of abnormal findings	(Chimbo & Motsi, 2024)
IoMT-enabled monitoring	Provides continuous collection and transmission of clinical data	Facilitates earlier identification of abnormalities	(Aljabr & Kumar, 2022)
Clinical decision support	Integrates patient data and provides alerts or recommendations	Assists recognition of potential diagnostic risks	(Almadani et al., 2025)
AI-assisted clinical reasoning	Supports identification of patterns within complex clinical data	Supplements professional judgment and diagnostic assessment	(Kuo, 2023)

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Overall, nursing contributions to diagnostic error prevention extend from bedside recognition and escalation to follow-up of diagnostic information and responsible use of digital decision-support systems. Integrating these activities into routine diagnostic pathways can strengthen opportunities to identify and correct potential errors before significant patient harm occurs.

6. Patient and Family Engagement in Diagnostic Safety

6.1 Patient-Reported Symptoms and Concerns

Patients are crucial for diagnostic safety as they know more about their symptoms and their health changes, how well the treatment is working and what they are afraid of that might not be known from the clinical assessment. The nurse can serve as the primary interface for patients and other members of the healthcare team and can be instrumental in ensuring that patient reported changes are recorded, understood, and communicated correctly. Nursing interventions can also play a role in technology-supported care, which enables patients to be involved as technology is used to monitor and communicate with them (Saber et al., 2024).

6.2 Family Observations and Support

Family members can share other details regarding changes in behaviour, function, symptom and daily status, especially when patients are not able to communicate properly. These observations can be used as part of an ongoing assessment and may be used by the nurse to determine if there are discrepancies or deteriorations that require additional assessment. In the case of complex and long-term care, the nurse also plays a role in coordinating concerns of patients and their families with patient management and continuity of care (Zabihi et al., 2024).

6.3 Shared Communication and Participation in Care

Clear, understandable and two-way communication is essential to effectively engage patients and families. Nurses play a key role in helping to ensure diagnostic safety by helping patients voice questions, report any changes in their symptoms, clear up any confusion, and be involved in decisions about their treatment. New AI tools are potentially able to facilitate education, monitoring and communication, and should be used as tools for the patient, and guided by professional nursing judgement. The literature highlighted the potential for AI to enhance the delivery of nursing care, but the importance of human interaction, trust, and clinical interpretation is emphasized. The literature indicates that while AI can complement nursing care, human interaction, trust, and clinical interpretation remain paramount (Rony et al., 2025).

In conclusion, there are additional potential benefits offered by patient and family engagement as a tool to help prevent diagnostic error. Through listening to concerns, taking in what is seen and

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facilitating shared communication, nurses may be able to ensure that information is relevant and helps to facilitate timely reassessment and safer diagnostic decision.

7. Barriers, Improvement Strategies, and Future Directions

Nurses have a good opportunity to contribute to diagnostic safety, but at the same time there are some barriers which can restrict this contribution. High workload, poor staffing, time pressure, poor communication between the different parts, hierarchical relationships, and limited involvement in the diagnostic decision-making process can diminish opportunities to raise concerns or escalate timely. Interpersonal differences in clinical experience and lack of formal education in diagnostic reasoning may contribute to differences in confidence in identifying and communicating potential diagnostic problems. Improving diagnostic safety thus demands an organizational culture that supports nurses' whistleblowing, a well-defined chain of command, a common language and communication approach, and a more accepted role for nurses as active members of the diagnostic team. The major barriers to nursing contributions in diagnostic safety and corresponding improvement strategies are presented in Table 5.

Table 5. Barriers and Strategies for Strengthening Nursing Contributions to Diagnostic Safety

Barrier or challenge	Potential effect on diagnostic safety	Improvement strategy	References
High workload and staffing limitations	Reduced surveillance time and delayed escalation	Adequate staffing, workload management, and prioritized surveillance	(Hassanein et al., 2025)
Limited diagnostic reasoning education	Reduced confidence in identifying diagnostic concerns	Targeted education in clinical reasoning and diagnostic safety	(Rony et al., 2024)
Fragmented digital systems	Incomplete or delayed access to relevant information	Better integration of electronic records and clinical information systems	(Ventura-Silva et al., 2024)

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Dependence on automated technology	Risk of overreliance on alerts and algorithmic recommendations	Maintain nurse oversight and combine technology with clinical judgment	(Rani et al., 2025)
Implementation challenges with emerging technology	May increase complexity, training demands, and workflow disruption	Structured implementation, staff preparation, and usability evaluation	(Vagharseyyedin & Mazruee, 2025)
Data privacy and cybersecurity concerns	May compromise confidentiality and trust in digital diagnostic systems	Strengthen governance, cybersecurity awareness, and accountability	(Elendu et al., 2024)

Improvements need to be achieved through a mix of education, teamwork and the proper use of technology. Nurses can be more effective in diagnostic processes by training in clinical reasoning skills, early recognition of deterioration, communicating uncertainty and escalating concerns. Digital decision-support systems, electronic documentation, and artificial intelligence can be used to help monitor, recognize, and identify clinical risks but must be used in conjunction with, not as a substitute for, professional nursing judgment. Despite facing challenges in the areas of usability, competence, ethics, and patient-centred care, current evidence suggests that AI holds great potential to enhance clinical and operational aspects of nursing practice. The overall digital transformation of nursing also opens up opportunities for embedding intelligent systems into nursing assessment and care coordination while ensuring effective clinician oversight (Ventura-Silva et al., 2024).

Future studies should include the creation of measurable nursing-sensitive diagnostic safety outcomes and the impact of nursing surveillance, escalation and communication on diagnostic outcomes. Future multicentre studies should be conducted to identify the most effective nursing interventions to help prevent missed or delayed diagnosis. Additional studies are also needed to explore the use of digital solutions in the context of nursing workflows, ensuring they do not add to alert fatigue, documentation overload, or reliance on automated suggestions. These areas may be important to consider making nurse contributions more visible and measurable as a part of diagnostic safety.

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8. Conclusion

Nurses play a crucial role in diagnostic safety by providing ongoing clinical oversight, communication, escalation and/or avoidance of missed or delayed diagnosis. Close and ongoing proximity with patients means that nurses are often best placed to notice minor variation in symptoms, response to treatment and clinical state. This constant monitoring can help identify signs of worsening and when the diagnosis needs to be reassessed. Their role is especially useful when there is some uncertainty about the diagnosis, or when there are changes in a person's health between visits to health care providers. The same is true for communication: it plays a crucial role in this contribution. Structured handovers, interprofessional collaboration, nurse–physician communication, and patient/family concerns contribute to not missing important diagnostic information. Nurses also assist with safer diagnosis through appropriate use of electronic records, remote monitoring, and decision-support technologies and by following abnormal findings and monitoring clinical progress. But the effectiveness of these strategies relies on staffing, staff culture, education on diagnostic reasoning and pathways for escalation. Improving the nursing contribution to diagnostic safety needs to shift from the nurse being viewed as a supportive care provider to an active partner in diagnosis. Future efforts are needed for measurable nursing sensitive indicators, enhanced communication systems, targeted education and careful integration of digital technologies. Nursing surveillance and communication would be more explicitly embedded in pathways to ensure diagnostics, and resulting patient safety, is optimized across all clinical settings and prevents unnecessary risks of diagnostic error.

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