The Review Of
DIABETIC
STUDIES OPEN ACCESS

Multidisciplinary Healthcare Collaboration and Patient Safety in Saudi Public Hospitals: Roles of Neurology, General Practice, Laboratory Sciences, Nursing, Pharmacy Technology, and Health Administration

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Abstract

Background: Preventable harm in hospitals commonly arises from fragmented information, delayed escalation, diagnostic error, medication-related failures, and weak transitions of care. These risks are particularly important in complex public hospital systems in which multiple professional groups contribute to a single episode of care.
Objective: This study aimed to develop a Saudi-contextualized conceptual framework that integrates neurology, general practice, laboratory sciences, nursing, pharmacy technology, and health administration to strengthen patient safety in public hospitals.
Methods: An integrative narrative review and conceptual synthesis were undertaken using international patient-safety guidance, peer-reviewed evidence on interprofessional collaboration, and Saudi studies addressing safety culture, communication, medication safety, primary care, and hospital transformation. The evidence was mapped to the structure-process-outcome model and translated into a closed-loop multidisciplinary framework. Results: The proposed framework comprises six interdependent professional domains supported by shared governance, standardized communication, interoperable clinical information, multidisciplinary safety huddles, escalation pathways, medication reconciliation, critical-result management, and continuous outcome measurement. Neurology provides time-sensitive specialist decision-making; general practice preserves whole-person continuity; laboratory sciences secure reliable diagnostic information; nursing supplies continuous surveillance and coordination; pharmacy technology protects the medication-use pathway; and health administration provides governance, resources, accountability, and implementation infrastructure. The framework specifies process and outcome indicators for staged evaluation.
Conclusion: Patient safety in Saudi public hospitals can be strengthened by moving from parallel disciplinary work toward explicit shared accountability and closed-loop communication. Prospective

pilot studies are required to test feasibility, clinical effectiveness, workforce acceptability, and cost-effectiveness.

Keywords: multidisciplinary collaboration; patient safety; neurology; general practice; laboratory medicine; nursing; pharmacy technology; health administration; Saudi Arabia; integrated care.

1. Introduction

Patient safety is a fundamental dimension of healthcare quality and a central requirement for universal health coverage. Harm may occur through unsafe medication use, delayed diagnosis, preventable infection, communication failure, inadequate monitoring, procedural error, and poorly coordinated transitions between departments or levels of care. The World Health Organization (WHO) has therefore called for health systems to eliminate avoidable harm through leadership, high-reliability processes, workforce capability, patient engagement, information systems, and continuous learning [1]. Although many safety events appear at the bedside, their causes often extend across professional and organizational boundaries. The relevant unit of analysis is therefore not a single clinician, but the network of people, technologies, policies, and handoffs through which care is delivered.

Interprofessional collaboration is associated with better communication, more complete clinical information, and improved organizational performance, although its effects depend on context, implementation fidelity, and team design [2-5]. In acute-care units, stronger nurse-physician and nurse-nurse collaboration has been associated with lower rates of pressure injury and patient falls [4]. Structured interdisciplinary rounds can improve communication, clarify daily goals, and strengthen patient-centred care, but poorly specified rounds may become ritualistic and fail to change outcomes [5,6]. This distinction is important: multidisciplinary presence alone is insufficient. Safe collaboration requires defined roles, psychological safety, reliable escalation, shared documentation, and closed-loop confirmation that critical actions have been completed.

Saudi Arabia is undertaking major health-system transformation, including service integration, health clusters, digital care, quality measurement, and expanded virtual services. These reforms create opportunities to improve coordination across public hospitals, primary care, and specialist services. Nevertheless, Saudi evidence has repeatedly identified weaknesses in non-punitive responses to error, staffing, communication openness, handoffs, and management support for safety [7-13]. These findings indicate that safety culture cannot be improved solely through individual training; organizational processes and interprofessional relationships must also be redesigned.

The present manuscript addresses a specific knowledge and practice gap. Existing studies commonly evaluate safety culture in one profession, a single hospital, or a limited clinical area. Few frameworks explicitly integrate specialist medicine, generalist continuity, diagnostic services, nursing surveillance, the technical medication workforce, and administrative governance within one operational model for Saudi public hospitals. This study therefore proposes an integrated framework covering neurology, general practice, laboratory sciences, nursing, pharmacy technology, and health administration. The framework is conceptual rather than empirically tested and is intended to guide implementation, evaluation, and future research.

2. Background and Literature Review

2.1 Multidisciplinary collaboration as a patient-safety mechanism

Collaboration improves safety when it changes how information is generated, interpreted, transferred, and acted upon. Reviews of hospital interprofessional collaboration report generally positive effects on staff, patient, and organizational outcomes, but also substantial heterogeneity arising from differences in team composition, leadership, workflow, and outcome measurement [2,3]. The most credible mechanisms include shared mental models, early recognition of deterioration, reconciliation of conflicting information, prevention of omitted tasks, and stronger accountability for follow-up. Communication tools such as SBAR, safety huddles, structured bedside rounds, checklists, and read-back of critical information are useful only when embedded in an organizational culture that allows all team members to speak up. Saudi systematic reviews and multicentre surveys indicate that teamwork within units is often rated more positively than teamwork across units, while handoffs, staffing, error response, and communication openness remain recurrent vulnerabilities [7-11]. Accordingly, the

proposed framework emphasizes cross-unit collaboration and escalation, not only collegiality within individual departments.

2.2 Neurology

Neurology exemplifies the need for time-sensitive multidisciplinary work. Acute stroke, status epilepticus, meningitis, acute neuromuscular weakness, and altered consciousness require simultaneous diagnostic, therapeutic, and monitoring processes. Stroke-unit care delivered by organized multidisciplinary teams improves survival and functional independence compared with care in general wards [14]. Contemporary stroke guidance also emphasizes rapid imaging, laboratory assessment, reperfusion eligibility, physiological monitoring, medication review, complication prevention, and early rehabilitation [15]. In the Saudi setting, national stroke standards support urgent neurological assessment and coordinated pathways [16]. Within the proposed model, neurologists lead specialist diagnostic formulation and neurological treatment decisions while sharing responsibility for escalation criteria, medication risk, and discharge planning. Neurology must interact bidirectionally with general practice to preserve continuity, with laboratory sciences to interpret time-critical results, with nursing to monitor neurological change, and with pharmacy teams to manage high-risk medicines such as anticoagulants, antiepileptics, thrombolytics, sedatives, and immunotherapies. Virtual neurology and specialist-to-specialist consultation may extend this expertise to hospitals with limited on-site coverage.

2.3 General Practice

General practice contributes a broad, patient-centered perspective that is essential for maintaining continuity and coordination across hospital care. General practitioners assess patients comprehensively by integrating presenting symptoms, comorbidities, previous treatments, medication history, social circumstances, patient preferences, and anticipated follow-up needs. Their patient-safety responsibilities include verifying allergies, reviewing current and previous medications, identifying diagnostic uncertainty, preventing unnecessary or duplicated investigations, coordinating referrals, and ensuring that important clinical information is transferred accurately between care settings. Research on patient safety culture in Saudi primary healthcare has reported generally positive attitudes while also identifying continuing weaknesses in communication, recognition of work-related stress, and management support [12]. Within the proposed framework, general practice serves as the principal continuity and coordination component. At admission, the general practitioner consolidates the patient's medical history, previous investigations, current medications, unresolved clinical problems, and relevant risk factors. During hospitalization, the general practitioner supports multidisciplinary decision-making by ensuring that specialty-specific interventions remain consistent with the patient's comorbid conditions, overall functional status, treatment priorities, and long-term care requirements.

This role is particularly important when several specialists are involved, as individual treatment recommendations may otherwise become fragmented, duplicated, or contradictory. General practitioners also contribute to the early recognition of deterioration and the appropriate escalation of care. They collaborate with neurologists when neurological symptoms or complications are suspected, with laboratory professionals when diagnostic findings require clarification, with nurses regarding bedside observations and changes in clinical status, and with pharmacy personnel regarding medication discrepancies, interactions, and dose adjustments. Such communication supports a more complete interpretation of the patient's condition and reduces the risk of decisions being made from incomplete or isolated information.

2.4 Laboratory Sciences

Laboratory medicine influences a large proportion of clinical decisions, and error can occur before analysis, during analysis, or after results are produced. Patient identification, specimen collection, labelling, transport, analytical quality control, reference intervals, result interpretation, and critical-value communication all affect safety [17,18]. The post-analytical phase is particularly vulnerable when abnormal results are released but not acknowledged or acted upon. The framework assigns laboratory professionals an active consultative role rather than treating the laboratory as a passive results service. Laboratory scientists should define critical-result thresholds, verify unusual findings,

document read-back, support diagnostic stewardship, and participate in antimicrobial and transfusion governance. They should also contribute to multidisciplinary review of delayed diagnoses, rejected specimens, contaminated cultures, repeat testing, and failures in result follow-up. Laboratory information systems must communicate with the electronic health record so that alerts reach the correct clinician and remain visible until acknowledged.

2.5 Nursing

Nurses provide continuous surveillance and are often the first professionals to detect deterioration, medication effects, falls risk, pressure injury, delirium, infection, or failure of a treatment plan. Saudi studies consistently identify teamwork within units as a relative strength while reporting weaknesses in staffing, handoffs, non-punitive response to error, and cross-unit coordination [8-11]. These findings underscore the importance of nurse participation in clinical decisions and safety governance. In the proposed framework, nursing roles extend beyond task execution. Nurses synthesize bedside observations, confirm completion of safety-critical actions, initiate escalation, coordinate specimens and medications, educate patients and families, and verify discharge readiness. Structured bedside handoff and escalation criteria are required so that early warning signs are communicated with sufficient urgency. Nurse leaders also support staffing decisions, competency assessment, incident review, and learning from near misses.

2.6 Pharmacy Technology

The medication-use system includes prescribing, verification, preparation, dispensing, storage, administration, monitoring, and reconciliation. Each stage can generate error, and risk increases when transitions, high-alert medicines, renal or hepatic impairment, polypharmacy, or incomplete records are present. A recent Saudi systematic review identified persistent medication-error problems and highlighted the preventive contribution of clinical pharmacy services [19]. International evidence also supports multidisciplinary medication review involving physicians, pharmacists, and nurses, particularly for complex and older patients [20]. Pharmacy technology in this manuscript includes the coordinated work of pharmacists and pharmacy technicians. Pharmacists provide clinical verification, dose optimization, interaction assessment, therapeutic monitoring, and patient counselling. Pharmacy technicians support accurate dispensing, compounding, inventory control, automated cabinets, barcode workflows, and documentation under appropriate supervision. The model does not assign independent clinical judgement to technicians beyond regulated scope; instead, it uses technical specialization to protect workflow reliability and free pharmacists for clinical review. Medication reconciliation at admission, transfer, and discharge is treated as a shared process requiring physician, nursing, pharmacy, and patient input.

2.7 Health Administration

Health administration is the sixth and enabling discipline. Administrators determine staffing, digital infrastructure, governance, reporting systems, procurement, training, and accountability. Patient safety culture in Saudi Arabia is strongly influenced by leadership, workload, communication, and the organizational response to error [7,13]. Administrators must therefore establish conditions in which collaboration is expected, measured, and protected. Key administrative responsibilities include creating multidisciplinary governance committees, defining escalation authority, aligning performance indicators, supporting non-punitive incident reporting, ensuring interoperability, allocating protected time for safety huddles, and linking improvement work to accreditation and strategic priorities. Administration also has responsibility for equity: the framework should be implemented across urban and regional hospitals while using virtual services and referral networks to compensate for uneven specialist availability. The complementary contributions of the six disciplines are summarized in **Table 1.**

Table 1. Discipline-specific roles, safety risks addressed, and required interfaces in the proposed framework.

Discipline	Core contribution	Principal safety risks addressed	Required interfaces

Neurology	Time-sensitive specialist diagnosis; neurological treatment; escalation and follow-up	Delayed stroke or seizure treatment; neurological deterioration; high-risk neuropharmacology	General practice, nursing, laboratory, pharmacy, administration
General practice	Whole-person assessment; continuity; reconciliation; referral and discharge coordination	Information loss; conflicting plans; missed comorbidity; unsafe transitions	Neurology, nursing, laboratory, pharmacy, community services
Laboratory sciences	Specimen quality; analytical reliability; critical-result communication; diagnostic stewardship	Misidentification; delayed or inaccurate results; failure to act on critical values	Physicians, nursing, pharmacy, informatics, quality teams
Nursing	Continuous surveillance; medication administration; escalation; education; care coordination	Failure to recognize deterioration; administration errors; falls; infection; handoff failure	All clinical disciplines and administration
Pharmacy technology	Clinical medication review plus safe technical preparation, dispensing and storage	Prescribing, dispensing, reconciliation and monitoring errors; high-alert medicines	Physicians, nursing, laboratory, digital systems
Health administration	Governance; workforce; resources; digital infrastructure; measurement and learning	Siloed care; punitive culture; staffing gaps; weak accountability; fragmented systems	All disciplines, accreditation bodies and national programs

3. Aim of the Study

The aim of this study was to develop a comprehensive conceptual framework for multidisciplinary collaboration in Saudi public hospitals that defines and integrates the patient-safety roles of neurology, general practice, laboratory sciences, nursing, pharmacy technology, and health administration. Secondary objectives were to identify implementation requirements, propose measurable indicators, compare the framework with common siloed practice, and define priorities for empirical evaluation.

4. Methods and Conceptual Development

4.1 Design

This study used an integrative narrative review and conceptual synthesis.

4.2 Evidence domains

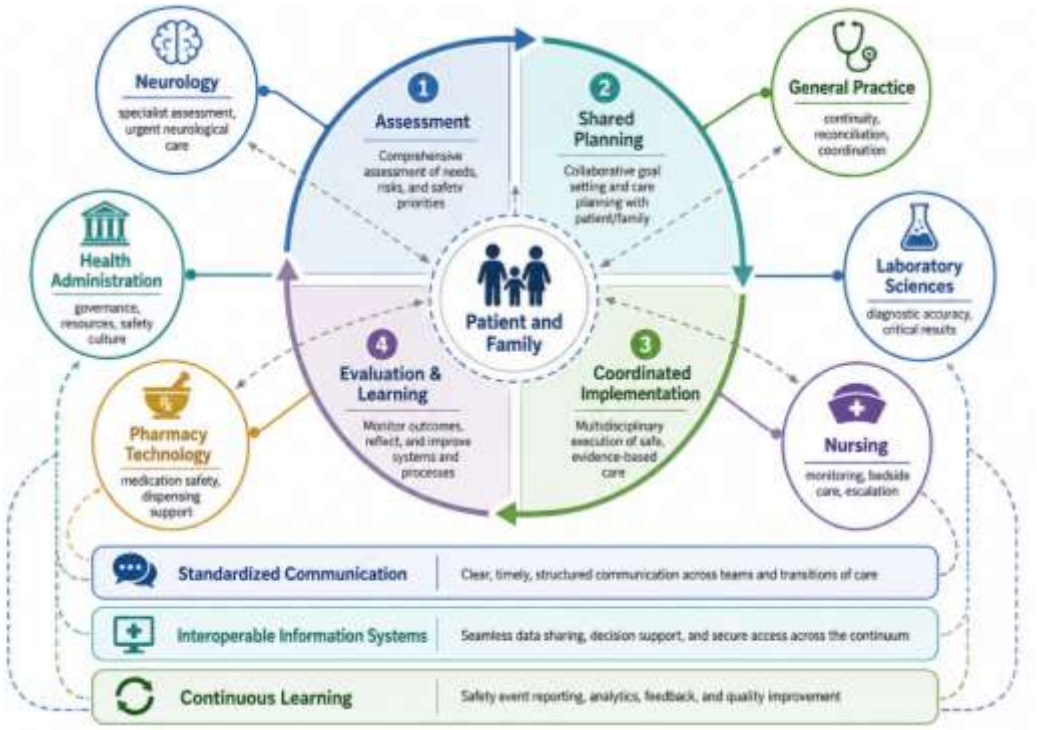
Evidence was organized into five domains: (1) international patient-safety strategy; (2) interprofessional collaboration and structured rounds; (3) Saudi patient-safety culture and healthcare transformation; (4) discipline-specific safety functions; and (5) implementation science and quality measurement. Priority was given to systematic reviews, national or international guidance, multicentre studies, and recent Saudi evidence. Earlier seminal work was retained when it provided the conceptual basis for structure-process-outcome evaluation [21].

4.3 Framework construction

Findings were mapped to Donabedian's structure-process-outcome model [21]. Structures included staffing, governance, electronic records, protocols, training, and technical systems. Processes included

shared assessment, multidisciplinary planning, closed-loop communication, medication reconciliation, critical-result management, escalation, and discharge coordination. Outcomes included preventable adverse events, medication harm, diagnostic delay, falls, pressure injury, readmission, length of stay, patient experience, safety climate, and staff experience. As shown in the **Figure 1**, the overall conceptual architecture: the patient and family at the centre; six professional domains around the patient; a four-stage clinical cycle; and three cross-cutting enablers consisting of governance, digital interoperability, and safety culture.

Figure 1. Integrated Multidisciplinary Patient Safety Framework for Saudi public hospitals



5. Results: Proposed Integrated Model

5.1 Core operating cycle

The conceptual synthesis generated a four-stage operating cycle. First, shared assessment combines physician evaluation, nursing risk assessment, laboratory data, medication history, and prior records. Second, multidisciplinary planning converts these inputs into prioritized goals, assigned responsibilities, escalation criteria, and anticipated discharge needs. Third, coordinated implementation uses standardized orders, verified medicines, reliable specimen and result workflows, bedside monitoring, and documented communication. Fourth, evaluation compares the patient's response with agreed goals and safety indicators, followed by modification of the plan or preparation for transition. The cycle repeats whenever the patient's condition, setting, or treatment changes. **Table 2** translates this cycle into structures, processes, and expected outcomes. These outcomes are hypotheses for future testing rather than measured results of the present study.

Table 2. Structure-process-outcome specification of the proposed integrated model.

Domain	Required elements	Operational examples	Expected safety effect
Structure	Multidisciplinary governance; role descriptions; interoperable EHR; staffing; competency systems	Patient-safety committee with six disciplines; protected huddle time; critical-result alerts	Capacity for coordinated and accountable care
Assessment process	Unified history, medication list, risk	Neurological red flags; falls risk; renal function; allergy	Earlier risk recognition and fewer omitted data

	screening, diagnostic plan	and medicine verification	
Planning process	Shared goals, task assignment, escalation criteria, discharge planning from admission	Daily goals sheet; named owner and deadline for each critical action	Reduced ambiguity and delayed action
Implementation process	Closed-loop communication, barcode workflows, specimen identification, protocolized monitoring	Read-back of critical values; high-alert medicine double checks	Fewer medication, diagnostic and communication failures
Evaluation process	Daily review, incident learning, outcome dashboards, patient feedback	Multidisciplinary review of deterioration, near misses and pending results	Continuous adaptation and organizational learning
Outcome domain	Clinical, process, workforce and patient-reported indicators	Harm rates, turnaround times, reconciliation completion, safety climate	Evidence for effectiveness, sustainability and equity

5.2 Closed-loop information and escalation

The model requires that safety-critical information be transmitted, acknowledged, interpreted, and acted upon. A sent message is not considered complete communication. Critical laboratory values, neurological deterioration, medication discrepancies, allergy conflicts, and pending discharge results should generate an alert to a named responsible professional. The action and response time should be documented. Escalation should be based on clinical urgency rather than professional hierarchy.

Figure 2. Closed-loop communication and escalation pathway.

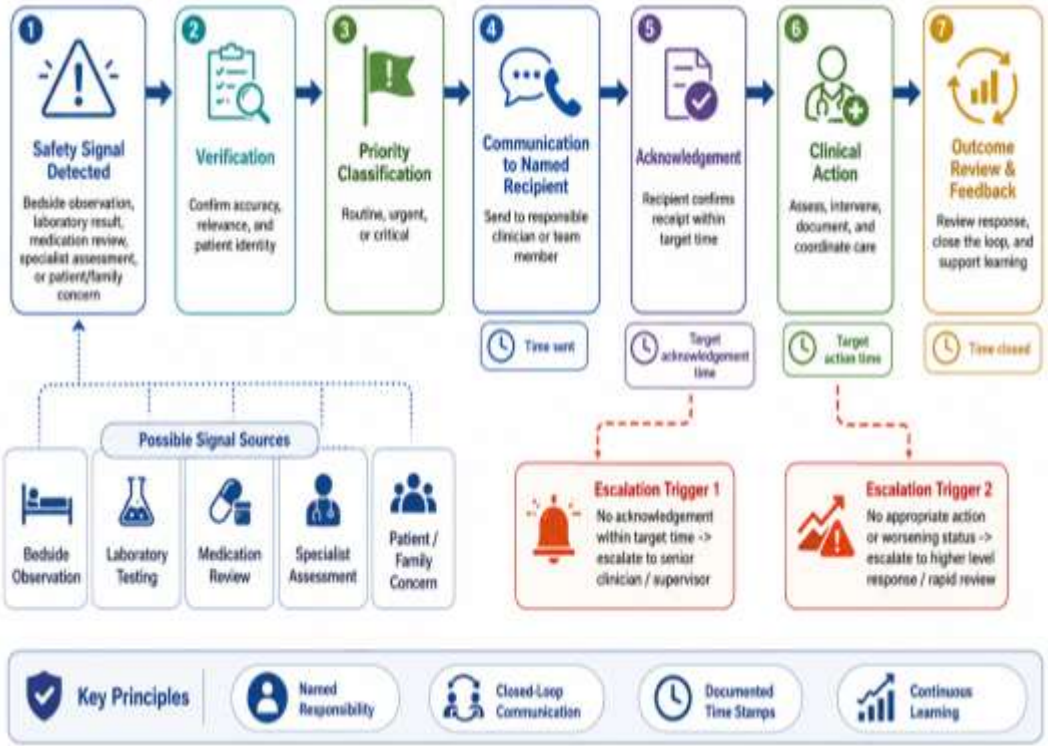


Figure 2 show the clinical information pathway from detection of a risk through verification, communication, acknowledgement, action, and outcome review. Failure points are shown at each stage, together with the discipline responsible for prevention.

5.3 Multidisciplinary safety routines

Routine collaboration should occur at predictable points: admission, daily review, transfer between units, clinical deterioration, and discharge. A brief daily safety huddle should identify unstable patients, unresolved critical results, high-risk medicines, pending consultations, staffing constraints, and discharge barriers. The huddle is distinct from a lengthy case conference; it should be focused, standardized, and action-oriented. Complex cases should receive a fuller multidisciplinary review.

5.4 Measurement framework

The proposed framework includes balanced indicators so that improvement in one domain does not conceal deterioration in another. Table 3 specifies example measures. Hospitals should begin with a limited core set and stratify results by hospital, unit, patient group, and region to identify inequity.

Table 3. Proposed indicators for pilot evaluation of the framework.

Indicator category	Example measure	Definition / numerator-denominator	Suggested frequency
Clinical harm	Preventable adverse events	Events judged preventable per 1,000 admissions	Quarterly
Medication safety	Reconciliation completion	Patients with verified medication reconciliation within 24 h / eligible admissions	Monthly
Diagnostic safety	Critical-result closure	Critical laboratory results acknowledged and acted upon within target time / all critical results	Monthly
Neurological care	Time to specialist decision	Median time from qualifying alert to documented neurology decision	Monthly
Nursing surveillance	Deterioration escalation compliance	Escalations completed according to protocol / eligible deterioration events	Monthly
Transitions	Discharge communication completeness	Discharges containing medication changes, pending results, follow-up owner and red flags / all discharges	Monthly
Safety culture	Communication openness and non-punitive response	Validated survey composite scores	Every 6-12 months
Patient experience	Understanding of care plan	Patients reporting clear understanding of medicines, follow-up and warning signs	Quarterly
System performance	Unplanned readmission and length of stay	Risk-adjusted 30-day readmission; median length of stay	Quarterly

5.5 Staged implementation

Implementation should proceed in phases. The preparation phase establishes leadership sponsorship, baseline measurement, role mapping, and digital readiness. The pilot phase tests the model in a high-risk unit such as stroke, internal medicine, or intensive care. The scale-up phase adapts workflows across departments while preserving core components. The sustainability phase embeds indicators in governance, orientation, accreditation preparation, and budgeting.

Figure 3. Multidisciplinary collaboration framework for patient safety in Saudi hospital.

6. Discussion

6.1 Principal contribution

The principal contribution of this manuscript is an operationally explicit, Saudi-contextualized framework that connects six professional domains through a common safety cycle. It advances beyond descriptive statements that collaboration is beneficial by specifying who contributes what, when interaction should occur, how communication should close, and which indicators should be measured. The model also distinguishes between multidisciplinary composition and interprofessional integration. A team may include several professions yet remain unsafe when information is unidirectional, responsibilities are implicit, or lower-status staff cannot escalate concerns.

6.2 Comparison with current practice

Common hospital workflows are sequential: a physician orders, the laboratory reports, pharmacy dispenses, and nursing administers. This arrangement can function when cases are simple and information is complete, but it is vulnerable when decisions are time-sensitive or ambiguous. The proposed model replaces linear transfer with feedback loops. Laboratory professionals can question inappropriate testing or verify unexpected results; nurses can trigger review based on deterioration; pharmacy teams can resolve discrepancies before administration; general practitioners can identify conflicts with chronic-care plans; and administrators can address recurrent system defects. The model is consistent with evidence that interprofessional collaboration can improve patient and organizational outcomes [2-6], but it remains cautious about causality. Collaboration interventions vary substantially, and positive effects are not automatic. A daily meeting that lacks preparation, role clarity, patient involvement, or accountability may increase workload without improving safety. Accordingly, the framework treats fidelity and context as central evaluation variables.

6.3 Saudi relevance

The framework directly addresses recurring weaknesses identified in Saudi safety-culture research, particularly handoffs, staffing, communication openness, non-punitive response to error, and teamwork across units [7-13]. It also aligns with national transformation toward integrated and digitally supported services. However, digital transformation should not be equated with safety. Electronic systems can introduce alert fatigue, duplicate records, poor usability, and new

communication gaps. Technology must therefore support clearly designed clinical responsibilities rather than substitute for them.

6.4 Role-specific integration

Neurology contributes a useful test case because safe outcomes depend on minutes, parallel workflows, and coordinated follow-up. General practice protects continuity and prevents the hospital episode from becoming disconnected from the patient's broader health needs. Laboratory sciences strengthen diagnostic safety by ensuring that results are valid and acted upon. Nursing provides the continuous observational layer that no episodic consultation can replace. Pharmacy technology creates a two-level medication safeguard: clinical review by pharmacists and reliable technical execution by trained technicians. Health administration converts these professional capabilities into a sustainable system through staffing, governance, informatics, and accountability.

6.5 Implementation barriers and opportunities

Implementation barriers are summarized in Table 4. The most important barrier is not lack of professional knowledge but failure to redesign authority and workflow. Hierarchy can suppress escalation; workload can convert huddles into additional burden; fragmented information systems can obscure ownership; and punitive responses can drive under-reporting. Conversely, national transformation, expanding virtual services, accreditation requirements, and growing local safety research create a favourable environment for structured pilots.

Table 4. Anticipated barriers, consequences, and mitigation strategies.

Barrier	Likely consequence	Mitigation strategy
Professional hierarchy and low psychological safety	Delayed escalation; unchallenged errors; silence from non-physician staff	Leadership behaviours, explicit stop-the-line authority, simulation, non-punitive review
Staffing pressure and workload	Missed huddles, superficial reconciliation, delayed results	Protected time, workload redesign, phased implementation, technician role optimization
Fragmented or poorly usable digital systems	Duplicate information, alert fatigue, unclear task ownership	Interoperability standards, role-based alerts, acknowledgement tracking, usability testing
Unclear scope and responsibility	Duplication, omissions, interprofessional conflict	Written role matrix, named task owner, escalation rules, competency validation
Language and cultural diversity	Misunderstanding in handoffs and patient education	Standard terminology, structured tools, teach-back, culturally responsive training
Punitive incident response	Under-reporting and loss of organizational learning	Just-culture policy, confidential reporting, feedback to reporters, system-focused analysis
Unequal specialist access across regions	Delayed neurology and pharmacy input	Virtual consultation, hub-and-spoke pathways, standardized referral and transfer criteria
Weak measurement capacity	Inability to demonstrate benefit or detect unintended effects	Small core indicator set, automated extraction, data-quality auditing, mixed-method evaluation

6.6 Future research

Future research should begin with mixed-method pilot studies rather than immediate system-wide implementation. A stepped-wedge or controlled before-and-after design could assess clinical and process outcomes while qualitative work examines acceptability, hierarchy, workload, and patient experience. Research should report intervention fidelity, baseline context, staffing, digital maturity, and cost. Studies should also evaluate whether benefits differ between tertiary urban hospitals and

regional facilities. Finally, patient and family participation should be tested as an active safety component rather than a passive educational endpoint.

7. Strengths and Limitations

This manuscript has several strengths. It integrates clinical, diagnostic, technical, nursing, and administrative roles; uses a recognized structure-process-outcome logic; separates proposed outcomes from empirical findings; includes explicit indicators; and responds to documented Saudi safety-culture weaknesses. The framework is sufficiently specific to guide pilot implementation while remaining adaptable to different hospital contexts.

Several limitations must be acknowledged. The review was integrative rather than systematic, and no formal risk-of-bias assessment or meta-analysis was undertaken. The framework has not been validated by a multidisciplinary Saudi expert panel, patients, or hospital leaders. It focuses on six disciplines and does not fully represent radiology, rehabilitation, emergency medicine, infection prevention, respiratory therapy, social work, or health informatics. Some proposed indicators may require adjustment according to local data availability. Most importantly, expected benefits remain hypotheses until tested prospectively.

8. Clinical, Practical, and Public Health Implications

Clinically, the model provides a method for identifying and closing gaps that cross professional boundaries. It can be applied to stroke, polypharmacy, sepsis, diagnostic uncertainty, and complex discharge. Practically, it gives hospital managers a role matrix, operating cycle, indicator set, and staged implementation plan. From a public-health perspective, reducing preventable harm may lower disability, readmissions, avoidable expenditure, and loss of public trust. Standardized collaboration can also improve equity by supporting consistent care across hospitals and enabling specialist input through virtual networks.

9. Recommendations

1. Establish a hospital-level multidisciplinary patient-safety governance group with representation from all six disciplines and clear executive accountability.
2. Pilot the framework in a high-risk pathway, preferably acute stroke or complex medical admissions, before broader scale-up.
3. Implement brief structured safety huddles at admission, daily review, transfer, deterioration, and discharge.
4. Adopt closed-loop management of critical laboratory results, medication discrepancies, and escalation alerts with named ownership and time targets.
5. Standardize medication reconciliation at every transition and define the complementary responsibilities of physicians, nurses, pharmacists, technicians, and patients.
6. Strengthen non-punitive incident reporting and provide visible feedback showing how reports led to system change.
7. Integrate patient and family teach-back into discharge and high-risk treatment pathways.
8. Develop interoperable dashboards using a small balanced set of process, harm, workforce, and patient-experience indicators.
9. Use simulation and interprofessional education to rehearse stroke, deterioration, medication, and diagnostic-safety scenarios.
10. Evaluate effectiveness, acceptability, equity, fidelity, and cost before national or cluster-wide adoption.

10. Conclusion

Patient safety in Saudi public hospitals depends on how reliably professional expertise is connected across the full care pathway. The proposed framework integrates neurology, general practice, laboratory sciences, nursing, pharmacy technology, and health administration through shared assessment, multidisciplinary planning, coordinated implementation, closed-loop communication, and continuous evaluation. Its value lies in replacing parallel disciplinary work with explicit shared accountability. The framework is aligned with documented Saudi safety priorities, but its feasibility

and effectiveness require prospective testing. Carefully designed pilots with balanced outcome measurement should be the next step.

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