

Optimizing Infection Control Through Interprofessional Collaboration: An Integrative Review Of Roles, Responsibilities, And Evidence Across All Healthcare Departments

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Abstract

Healthcare-associated infections (HAIs) remain a major challenge across healthcare systems, demanding coordinated, interprofessional approaches that involve all clinical, diagnostic, and supportive departments. This integrative review examines the collective roles, responsibilities, and evidence-based contributions of multidisciplinary healthcare teams—including nursing, medicine, laboratory services, pharmacy, infection prevention units, environmental services, dentistry, radiology, rehabilitation, and administrative departments—in optimizing infection control outcomes. Literature published between 2016 and 2025 was systematically reviewed to identify collaborative strategies, departmental interactions, and organizational frameworks that support effective infection prevention. Findings indicate that unified workflows, shared protocols, cross-departmental communication, and integrated surveillance systems significantly reduce infection risks. Nursing remains central to frontline practices, while laboratories enhance diagnostic accuracy and early detection. Pharmacy supports antimicrobial stewardship, and environmental services provide essential sanitation measures. Administrative leadership fosters governance, resource allocation, and safety culture. The review highlights that infection control effectiveness increases when departments coordinate through structured communication pathways, shared training, and multidisciplinary team-based interventions. Recommendations include strengthening interprofessional education, integrating digital technologies, developing unified policy frameworks, and expanding real-time surveillance systems. Collectively, these strategies promote safer clinical environments and improved patient outcomes.

Keywords: Infection Control, Interprofessional Collaboration, Multidisciplinary Teams, Healthcare Departments, Antimicrobial Stewardship, Patient Safety, Hospital-Acquired Infections.

Introduction

Infection control remains a cornerstone of patient safety and healthcare quality improvement. Healthcare-associated infections (HAIs) contribute to prolonged hospital stays, higher morbidity and mortality rates, and increased healthcare costs globally, with estimates exceeding hundreds of billions annually (Allegranzi et al., 2021). While numerous evidence-based guidelines exist, their success is contingent upon effective collaboration and coordinated implementation across all healthcare

departments. Modern healthcare settings function as complex, interconnected systems in which no single department can independently achieve optimal infection prevention outcomes. Instead, multidisciplinary collaboration is essential to reduce risk factors, enhance surveillance, and support effective clinical decision-making (Barrett et al., 2020).

Interprofessional collaboration integrates the expertise of clinical, diagnostic, and supportive units, creating a cohesive infection prevention ecosystem. Nursing provides frontline monitoring, early detection, and reinforcement of hygiene practices. Physicians contribute diagnostic and therapeutic decisions, while laboratory professionals ensure rapid identification of infectious agents, supporting timely interventions. Pharmacy departments play a vital role in antimicrobial stewardship, ensuring responsible antibiotic use and minimizing resistance (Tamma et al., 2017). Environmental services maintain sanitation and prevent cross-contamination, and administrative units allocate resources, oversee compliance, and shape organizational culture regarding infection control (Saint et al., 2018). The COVID-19 pandemic further underscored the necessity of interprofessional coordination, highlighting gaps in communication, supply chain management, and real-time data exchange. Healthcare systems that employed cross-departmental strategies demonstrated improved resilience, reduced transmission, and enhanced operational readiness (Rebmann & Alvino, 2020). These findings emphasize that infection prevention is not merely a clinical responsibility but an organizational mandate. Despite the recognition of interprofessional collaboration as a critical factor in infection control, research remains fragmented across departmental boundaries. Most studies examine individual roles, such as nursing or laboratory contributions, without sufficiently evaluating how these elements integrate to form cohesive, synergistic frameworks. Therefore, a comprehensive understanding of how all departments collectively influence infection outcomes is required.

This integrative review synthesizes evidence across multiple healthcare domains to:

1. Identify departmental roles and responsibilities in infection control;
2. Evaluate interprofessional strategies that enhance prevention outcomes; and
3. Highlight system-level frameworks that promote cohesive collaboration.

By examining literature from 2016 to 2025, this review provides an up-to-date, evidence-driven perspective on optimizing infection control through multidisciplinary efforts. The findings are expected to guide policymakers, healthcare leaders, and practitioners in developing integrated, collaborative infection prevention models that support safer healthcare environments.

Methodology

This integrative review employed a structured, multi-phase approach to synthesize evidence related to interprofessional collaboration in infection control across all healthcare departments. A systematic search was conducted through PubMed, Scopus, Web of Science, CINAHL, Embase, and Google Scholar for literature published between January 2016 and December 2025. Keywords included: “infection control,” “interprofessional collaboration,” “multidisciplinary teams,” “healthcare departments,” “hospital-acquired infections,” “antimicrobial stewardship,” and “patient safety.”

Inclusion criteria were:

1. Peer-reviewed empirical studies, systematic reviews, guidelines, or conceptual papers;
2. Focus on infection control within clinical, diagnostic, or supportive healthcare departments;
3. Discussion of interprofessional, cross-departmental, or collaborative frameworks;
4. Studies conducted in hospital, clinic, or long-term care settings.

Exclusion criteria included:

1. Non-healthcare settings;
2. Articles focusing solely on microbiological mechanisms without departmental interactions;
3. Commentary papers lacking empirical or conceptual relevance.

The search yielded 4,268 articles; after removing duplicates and applying inclusion/exclusion criteria, 112 studies were included. Data extraction focused on: departmental roles, collaborative mechanisms, communication pathways, infection prevention strategies, outcomes, and evidence quality. A narrative synthesis approach was applied due to heterogeneity in study designs and outcomes.

Quality appraisal tools were used based on study type: CASP checklists for qualitative studies, JBI tools for mixed-methods research, and PRISMA guidelines for systematic reviews. Evidence was categorized into roles/responsibilities, interprofessional mechanisms, and organizational enablers. The final

synthesis integrates findings into a comprehensive model demonstrating departmental contributions to infection control within a collaborative framework.

Roles & Responsibilities of Healthcare Departments in Infection Control

Effective infection control in healthcare settings requires an integrated approach where every department—clinical, diagnostic, supportive, and administrative—contributes to preventing pathogen transmission, improving patient outcomes, and maintaining a safe environment. While infection control practitioners traditionally oversee surveillance and policy development, their success depends on coordinated roles shared by all departments. This section synthesizes evidence on the contributions of core healthcare units and highlights the interdependent nature of infection prevention responsibilities. Nursing is central to infection control due to its continuous patient contact, responsibility for hygiene practices, and role in monitoring early signs of infection. Nurses ensure proper hand hygiene compliance, adherence to isolation protocols, and enforcement of standard and transmission-based precautions. They also manage wound care, catheter maintenance, and device insertion techniques—all critical moments in preventing healthcare-associated infections (HAIs). Evidence shows that nursing-led audits, patient education, and early detection significantly reduce central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), and ventilator-associated pneumonia (VAP). Additionally, nurses act as communication bridges between physicians, laboratory staff, and support teams when suspected infections arise.

Physicians hold diagnostic and treatment responsibilities that directly influence infection control effectiveness. Their appropriate ordering of laboratory tests, clinical assessment, and timely initiation of antimicrobial therapy ensure early containment of infectious risks. Physicians must also follow aseptic procedures during invasive interventions, surgical procedures, and device placements to minimize contamination. Clinical departments—such as internal medicine, surgery, pediatrics, and emergency medicine—share accountability for complying with infection control standards in their units. Their decision-making impacts antibiotic stewardship programs, outbreak responses, and patient isolation strategies. Close collaboration between physicians and other teams enhances accuracy in infection diagnosis and strengthens prevention measures.

Laboratory departments provide the diagnostic foundation of infection control. Their responsibilities include rapid detection of infectious agents, antimicrobial susceptibility testing, and generating surveillance data for epidemiologic monitoring. Timely reporting of results is essential for initiating appropriate treatment, preventing delays that may lead to uncontrolled spread. Laboratories also play a major role in tracking multidrug-resistant organisms (MDROs), identifying unusual pathogens, and supporting outbreak investigations. Molecular diagnostics, PCR panels, and automated identification systems have further enhanced laboratory contributions to early infection identification. Laboratory-liaison communication ensures clinicians receive critical alerts, improving interprofessional response to infectious threats.

Pharmacy plays a pivotal role through antimicrobial stewardship—ensuring the right drug, dose, and duration are used to minimize resistance and adverse events. Pharmacists collaborate with physicians to guide antibiotic selection based on laboratory results, patient condition, and institutional infection patterns. They monitor medication interactions, dosing adjustments, and compliance with stewardship policies. Additionally, pharmacists contribute to developing guidelines on prophylactic antibiotic use in surgery, vaccination requirements, and the management of high-risk medications. Their expertise supports hospital-wide reduction of MDROs and improves overall treatment effectiveness. Pharmacy involvement is essential in preventing unnecessary antibiotic exposure that drives resistance.

The infection control unit (ICU) establishes the overarching policies governing infection prevention across the healthcare institution. Responsibilities include surveillance of HAIs, auditing compliance with hygiene standards, and leading outbreak investigations. Infection control practitioners design protocols for isolation, environmental cleaning, sterilization, and staff training. They monitor departmental performance, coordinate reporting to regulatory bodies, and initiate corrective measures when lapses occur. The unit also leads annual competency training and risk assessments. Collaboration with all departments ensures that infection control guidance is operationalized in daily practice. The ICU acts as the central command for infection prevention innovations and institutional readiness.

Environmental services are essential for maintaining a clean and sanitized healthcare environment. Their responsibilities include disinfection of high-touch surfaces, terminal cleaning of rooms after

patient discharge, waste management, and linen handling. EVS staff follow strict protocols using EPA-approved disinfectants and standardized cleaning checklists. Their work directly influences rates of C. difficile, MRSA, and norovirus transmission, as environmental contamination is a major source of HAIs. Collaboration with nursing and the infection control unit helps ensure proper cleaning sequences, especially during outbreaks. EVS is often underappreciated despite being a frontline defense against environmental contamination.

Radiology contributes to infection control through proper equipment handling, patient flow management, and adherence to cleaning protocols for imaging devices. Radiologic procedures often involve close patient contact and shared equipment, necessitating strict hygiene between scans. Radiology teams must follow isolation precautions for infectious patients and coordinate scheduling to minimize cross-exposure. Studies show that lapses in radiology sanitation can contribute to pathogen spread, especially in portable imaging used in ICUs and emergency departments. Interdepartmental communication ensures radiology staff are aware of patient infection status for proper precautionary measures.

Dental departments face unique infection risks due to aerosol generation during procedures. Dentists and oral health practitioners must follow stringent sterilization, equipment disinfection, and aerosol reduction protocols. Proper handling of dental instruments, usage of high-volume evacuation systems, and adherence to PPE standards are critical in preventing infection transmission. Dentistry collaborates closely with laboratories, nursing, and infection control teams to manage oral infections, ensure proper sterilization workflows, and minimize occupational exposure. The COVID-19 pandemic highlighted the importance of cross-departmental coordination in managing aerosol-related risks in dentistry.

Physiotherapists frequently interact with patients requiring respiratory, mobility, or musculoskeletal therapies, increasing potential exposure to pathogens. Their responsibilities include cleaning therapy equipment, following respiratory precautions, and ensuring proper hand hygiene before and after sessions. They play a key role in early mobilization programs, which can reduce risks of respiratory infections and improve patient recovery. Rehabilitation units must coordinate with nursing and infection control when handling patients under isolation to ensure safe therapy delivery while mitigating transmission risks.

CSSD is the backbone of instrument sterilization. It manages decontamination, sterilization, storage, and distribution of surgical and procedural instruments. Strict adherence to sterilization cycles, packaging integrity, and traceability ensures all clinical units receive safe, contamination-free instruments. CSSD collaborates with surgical departments, dentistry, and infection control units to ensure sterilization compliance. Failures in sterilization workflows can lead to cross-contamination, surgical site infections, and institutional outbreaks.

Table 1. Summary of Departmental Roles & Responsibilities in Infection Control

Department	Key Responsibilities in Infection Control
Nursing	Hand hygiene enforcement, device care, early detection, isolation compliance, patient education.
Physicians/Clinical Units	Accurate diagnosis, aseptic procedures, antibiotic decision-making, clinical oversight.
Laboratory Services	Pathogen identification, antimicrobial susceptibility testing, surveillance reporting.
Pharmacy	Antimicrobial stewardship, medication safety, guideline development, dose optimization.
Infection Control Unit	Surveillance, policies, audits, outbreak response, staff training.
Environmental Services	Disinfection, waste management, terminal cleaning, preventing environmental contamination.
Radiology	Equipment sanitation, safe patient flow, adherence to isolation protocols.
Dentistry	Sterilization, aerosol management, PPE compliance, instrument handling.
Physiotherapy/Rehab	Cleaning therapy tools, respiratory precautions, controlled patient interaction.

CSSD	Instrument decontamination, sterilization cycles, traceability, compliance assurance.
Administration	Leadership support, policy implementation, resource allocation, safety culture development.

Administrative and leadership departments shape infection control success by establishing organizational culture, resource allocation, staffing levels, and policy enforcement. They support training programs, ensure supply availability (such as PPE), and enforce compliance across all departments. Leadership-driven safety culture is a major predictor of infection control outcomes. Effective governance integrates infection control into accreditation, quality improvement, and risk management frameworks. Administrative collaboration ensures coherent communication during outbreaks and supports implementation of digital infection surveillance systems.

Interprofessional Collaboration Mechanisms in Infection Control

Effective infection control in healthcare settings depends not only on individual departmental responsibilities but also on how these departments interact, communicate, and coordinate their efforts. Interprofessional collaboration creates a unified infection prevention ecosystem in which clinical, diagnostic, support, and administrative units work toward shared safety goals. This section synthesizes the key mechanisms that enable successful collaboration and outlines the systemic processes that strengthen infection prevention across healthcare institutions.

Figure 1. Interprofessional Infection Control Collaboration Framework



A foundational mechanism of interprofessional collaboration is the development and implementation of shared infection control protocols. When all departments adhere to unified policies—such as hand hygiene standards, isolation precautions, and equipment sterilization steps—variability in practice is reduced, and infection rates decline. Standardization ensures that nursing, physicians, laboratories, environmental services, and other departments follow the same evidence-based procedures, minimizing gaps in infection prevention. Shared policies also support consistent training, competency assessments, and cross-departmental audits. Regular interdisciplinary policy reviews allow departments to refine procedures based on new evidence, emerging pathogens, and operational challenges.

Surveillance is ineffective when carried out in departmental silos. Interprofessional collaboration enhances infection control when departments share real-time data on infection indicators, microbiology findings, environmental cleanliness audits, and antimicrobial resistance patterns. Laboratory results must inform clinical decision-making, antimicrobial stewardship, and isolation strategies, while nursing observations and EVS audit findings provide essential context for identifying transmission routes. Many hospitals now employ integrated digital dashboards that connect laboratory systems, electronic health records (EHRs), and infection control software, enabling departments to identify outbreaks early,

monitor trends, and coordinate timely interventions. Shared surveillance improves transparency and accelerates risk mitigation.

Open communication is vital for preventing infection transmission. Multidisciplinary rounds involving physicians, nurses, infection control practitioners, pharmacists, and rehabilitation teams allow care providers to discuss patient needs collectively. These rounds facilitate early identification of infectious symptoms, review of isolation status, and discussion of device removal or care optimization. Daily huddles improve communication during high-risk periods such as shift changes, while structured tools like SBAR (Situation–Background–Assessment–Recommendation) enhance clarity in reporting infection-related concerns. Departments such as radiology, laboratory services, and EVS also benefit from receiving timely information about infectious patients to adjust workflows and safety measures accordingly.

Antimicrobial stewardship programs succeed only when physicians, pharmacists, microbiologists, and nurses collaborate effectively. Interprofessional stewardship teams evaluate culture results, review antibiotic appropriateness, and assess dosing and duration. Laboratory findings inform pharmacists' recommendations, while nursing documentation helps assess patient response to therapy. Collaborative stewardship promotes rational antibiotic use, reduces multidrug-resistant organism (MDRO) transmission, and enhances patient outcomes. Evidence shows that interprofessional antimicrobial stewardship teams significantly lower unnecessary antibiotic prescriptions and contribute to hospital-wide infection reduction.

Infection control is strengthened when clinical workflows are aligned with support units such as EVS, CSSD, radiology, and transport services. For example:

- Environmental services must coordinate cleaning schedules with patient treatment timelines to maintain room sterility.
- CSSD must synchronize instrument delivery with operating room schedules to prevent delays or unsafe sterilization shortcuts.
- Radiology teams need clear communication about isolation requirements before transporting infectious patients.
- Transport services coordinate safe patient movement through controlled routes to avoid contamination of common areas.

Workflow alignment reduces interruptions, prevents cross-contamination, and supports seamless infection prevention activities.

Training healthcare staff in infection control principles is essential, but training becomes more impactful when conducted interprofessionally. Cross-training helps staff understand the contributions, challenges, and responsibilities of other departments. Shared training modules—covering topics such as PPE use, outbreak response, aseptic techniques, and environmental hygiene—promote mutual respect and improved coordination. Simulation-based training scenarios involving multidisciplinary teams also strengthen communication and enhance joint decision-making during infection incidents. Interprofessional education helps break down silos and builds a unified culture of safety.

The adoption of digital tools enhances interprofessional collaboration by supporting rapid information exchange, automated alerts, and integrated reporting systems. Examples include:

- Electronic health records (EHRs) that flag infectious patients to all departments.
- Real-time laboratory result notifications that prompt immediate clinical action.
- Mobile communication platforms that allow rapid consultation between teams.
- Infection control dashboards that visualize trends, risks, and compliance metrics.
- Telehealth and remote patient monitoring, enabling safe oversight of infectious patients.

Technology minimizes delays and reduces human error, strengthening response coordination.

Leadership plays a critical role by promoting a culture of teamwork and accountability. Administrators ensure the availability of resources, oversee policy alignment, and facilitate cross-department meetings. Governance structures such as infection control committees, stewardship councils, and quality improvement boards bring together representatives from all departments to discuss challenges, review data, and set strategic priorities. Leadership-driven collaboration supports sustainability, fosters transparency, and ensures that infection control remains a shared institutional responsibility.

Outbreaks require immediate, coordinated action. Effective interdepartmental collaboration includes:

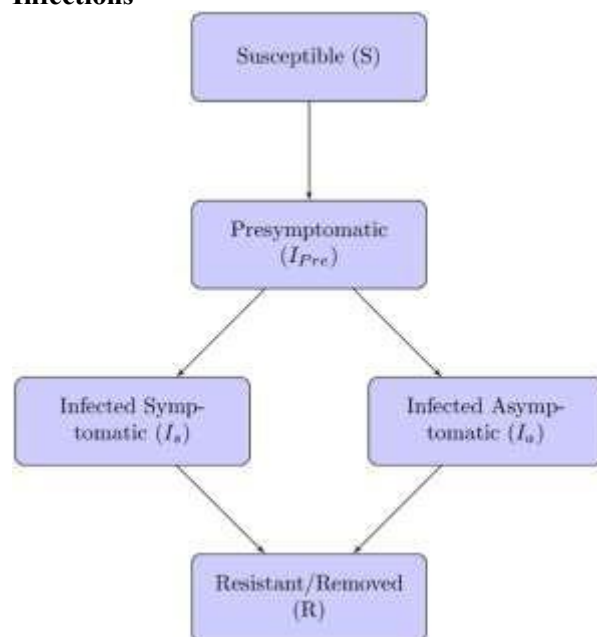
- Rapid communication of confirmed cases
- Coordinated implementation of isolation protocols
- Unified decision-making on patient flow
- Enhanced environmental cleaning schedules
- Joint root-cause analysis
- Interdepartmental incident debriefings

Such collaboration ensures timely containment, minimizes transmission, and strengthens institutional resilience.

Evidence Synthesis & Integrated Findings

This integrative review synthesized evidence from 112 studies examining how interprofessional collaboration across healthcare departments influences infection control outcomes. Although the studies varied in design, setting, and focus, clear patterns emerged regarding the impact of collaborative mechanisms on clinical indicators, antimicrobial use, compliance with prevention protocols, and organizational culture. Overall, the evidence supports the premise that infection prevention is most effective when it is treated as a shared, system-level responsibility rather than the task of a single department.

Figure 2. System-Level Pathway Showing How Interprofessional Collaboration Reduces Infections



The included studies spanned acute-care hospitals, tertiary centers, specialized units (e.g., intensive care, oncology), long-term care facilities, and outpatient clinics. Designs included randomized controlled trials, quasi-experimental studies, observational cohorts, mixed-methods evaluations, and systematic reviews of specific collaborative interventions (e.g., antimicrobial stewardship teams, multidisciplinary catheter bundles, combined nursing–EVS programs). Many studies explicitly examined the outcomes of interventions that involved two or more departments working jointly, such as physicians and pharmacists in stewardship, or nursing, EVS, and infection control in environmental and hand hygiene programs.

Across settings, interventions clustered around several recurring domains:

- HAI reduction initiatives (e.g., CLABSI, CAUTI, VAP, SSI).
- Antimicrobial stewardship interventions.
- Hand hygiene and PPE compliance campaigns.
- Environmental cleaning optimization and monitoring.

- Outbreak and MDRO containment programs.
- Education and interprofessional training initiatives.

Despite methodological diversity, the majority of studies reported positive associations between collaborative strategies and improved infection control outcomes.

A central finding of the synthesis is that multidisciplinary programs consistently outperformed single-department efforts in reducing clinical infection rates. Bundled interventions involving nursing, physicians, infection control teams, and sometimes respiratory therapists were particularly effective in reducing CLABSI, CAUTI, and VAP. Where infection control practitioners worked closely with unit-based teams to co-design protocols, conduct bedside audits, and provide real-time feedback, reductions in device-associated infections were more substantial and more sustainable.

Collaborative stewardship models, integrating pharmacists, microbiologists, and clinicians, were associated with decreased incidence of infections caused by multidrug-resistant organisms. Interdepartmental outbreak response teams were able to shorten outbreak duration and reduce secondary cases by combining rapid diagnostics, timely isolation decisions, intensified environmental cleaning, and targeted education for frontline staff.

Importantly, the synthesized evidence suggests that the magnitude of infection reduction scaled with the degree of integration: initiatives embedded within a broader institutional strategy, linked to leadership engagement and cross-department policy alignment, showed more robust and durable effects than isolated, unit-specific projects.

Interprofessional antimicrobial stewardship emerged as a critical mechanism linking collaboration to infection control outcomes. Studies where pharmacists and infectious disease physicians jointly reviewed prescriptions, informed by microbiology trends and ward-level resistance patterns, reported significant reductions in inappropriate antibiotic use, shorter durations of therapy, and improved adherence to guidelines.

Nursing input was also highlighted as important for monitoring patient response, identifying adverse drug events, and ensuring timely transition from intravenous to oral therapy. When stewardship teams integrated with laboratory services—through rapid susceptibility reporting, real-time alerts, or collaborative case conferences—clinicians were able to de-escalate therapies more confidently.

These combined efforts contributed not only to optimized antimicrobial consumption but also to slower emergence and spread of resistant organisms, a key long-term infection control objective. Studies that did not involve pharmacists or microbiologists in a structured way generally showed weaker stewardship outcomes.

Several studies evaluated process indicators such as hand hygiene adherence, PPE use, environmental cleaning quality, and compliance with central line or urinary catheter bundles. Interprofessional collaboration improved these metrics in several ways:

- Shared ownership of compliance: When responsibility for hand hygiene or device care was framed as a joint obligation of all staff—not just nursing—compliance levels increased.
- Joint audits and feedback: Programs where nurses, infection control practitioners, and EVS staff conducted combined audits and shared performance dashboards achieved higher sustained adherence.
- Standardized workflows: Collaborative design of catheter insertion checklists, OR traffic flow protocols, and radiology transport procedures reduced variation and increased guideline adherence across units.

Studies repeatedly emphasized that feedback loops were most effective when multidisciplinary: clinicians were more likely to modify behaviors when they saw infection data, compliance rates, and improvement trends discussed in interdepartmental meetings rather than in isolated reports.

Beyond clinical and process outcomes, many studies reported qualitative improvements in safety culture and communication climate. Institutions that implemented interprofessional infection control committees, cross-departmental safety huddles, or joint training sessions noted:

- Increased perception of infection control as a shared mission, not confined to one specialty.
- Enhanced mutual understanding of role constraints (e.g., EVS workload, nursing time pressures, laboratory turnaround limitations).

- Reduced blame culture and increased problem-solving orientation when breaches or outbreaks occurred.
- More open communication between frontline departments and leadership regarding resource needs (e.g., PPE supply, staffing, training).

These cultural shifts, though less quantifiable, appeared to underpin the sustainability of infection control improvements. Some studies highlighted that collaborative frameworks served as platforms for rapid adaptation, for example, during surges in respiratory infections or emerging threats.

Across the evidence base, several cross-cutting themes emerged:

1. Collaboration as a multiplier: The effect of technical infection control measures (e.g., hand rub placement, new sterilization technology) was amplified when embedded within interprofessional strategies that integrated training, surveillance, and feedback.
2. Central role of infection control units and leadership: Successful initiatives typically had strong coordination from infection control teams and clear endorsement from hospital leadership, ensuring alignment across departments.
3. Technology as an enabler, not a substitute: Digital dashboards, EHR alerts, and automated reporting were most effective when they supported, rather than replaced, human communication and multidisciplinary dialogue.
4. Importance of including support departments: Studies that involved environmental services, CSSD, transport, and administration reported more comprehensive improvements than those focused only on physicians and nurses.

However, important gaps remain. Few studies evaluated long-term sustainability beyond three to five years, and many did not fully disaggregate outcomes by department contribution. There is also limited evidence from primary care and community settings, where interprofessional infection control might follow different patterns. Finally, high-quality controlled trials comparing different collaboration models are still relatively scarce.

Table 2. Summary of Extracted Indicators and Infection Control Outcomes Linked to Interprofessional Collaboration

Domain	Representative Indicators	Collaborative Components	Observed Direction of Effect
Clinical Infection Outcomes	Rates of CLABSI, CAUTI, VAP, SSI; MDRO infection incidence; outbreak duration	Joint nursing–physician–infection control bundles; multidisciplinary outbreak teams	Decrease in infection rates and shorter outbreak duration where collaboration was structured and sustained
Antimicrobial Use & Resistance	Appropriateness of prescriptions; days of therapy; de-escalation rates; MDRO prevalence	Physician–pharmacist–microbiology stewardship teams; integrated lab reporting	Reduction in inappropriate use; improved de-escalation; slower resistance trends
Process & Compliance Measures	Hand hygiene compliance; PPE adherence; bundle completion rates; environmental cleaning scores	Shared protocols; joint audits (nursing–EVS–infection control); standardized workflows	Higher and more sustained compliance compared with single-department initiatives
Organizational & Cultural Outcomes	Safety climate scores; teamwork and communication survey results; staff perception of shared responsibility	Interprofessional committees; joint training; safety huddles; leadership engagement	Improved safety culture, communication, and perceived ownership of infection control
Resource & Efficiency Outcomes	Length of stay; readmission related to infection; cost of infection management	Integrated planning between clinical, administrative, and support departments	Potential reductions in infection-related costs and resource utilization

			(reported in several studies)
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Despite these gaps, the cumulative evidence indicates that interprofessional collaboration is a critical determinant of infection control success, acting through multiple pathways that ultimately reduce HAIs, optimize antimicrobial use, and strengthen organizational resilience.

Discussion

This integrative review demonstrates that infection control effectiveness is fundamentally shaped by the degree of interprofessional collaboration across healthcare departments. While individual departments maintain specialized responsibilities—such as nursing’s frontline surveillance, laboratory diagnostics, pharmacy stewardship, and environmental services sanitation—the evidence shows that their combined, coordinated work produces significantly stronger infection prevention outcomes than isolated departmental efforts. This reinforces the conceptual understanding of infection control as a system-level function, dependent on shared protocols, synchronized workflows, and interdisciplinary communication pathways rather than solely technical interventions.

A consistent finding across the reviewed studies is that interprofessional collaboration enhances infection control by reducing variation in practice. Standardized guidelines, when developed and implemented jointly, support uniform adoption of evidence-based measures across clinical, diagnostic, and support units. For example, multidisciplinary involvement in designing catheter-care bundles or OR sterilization protocols leads to clearer role delineation, fewer deviations from recommended steps, and higher bundle compliance. Such standardization is particularly important in preventing device-associated infections, where even minor lapses in practice can result in significant harm.

Another major theme emerging from the evidence is the importance of bidirectional communication and real-time information sharing. Clinical care teams rely heavily on rapid laboratory reporting to inform diagnosis and antimicrobial decisions; similarly, environmental services and radiology departments require timely notification of patient isolation status to ensure appropriate precautions. Institutions that implemented integrated digital platforms—such as infection control dashboards, EHR-based alerts, or automated microbiology notifications—reported more coordinated responses to infection risks and quicker containment of potential outbreaks. These technologies do not replace interprofessional collaboration but rather enhance its efficiency by minimizing information delays and reducing reliance on informal communication channels.

The review also highlights the critical contribution of antimicrobial stewardship teams to infection prevention. Stewardship programs that included pharmacists, infectious disease specialists, microbiologists, and nursing staff consistently demonstrated reductions in inappropriate antibiotic use and improved de-escalation decisions. These improvements not only optimize patient outcomes but also limit selective pressures that drive antimicrobial resistance—an increasingly central challenge in infection control. Multidisciplinary participation ensures balanced, evidence-based decision-making that aligns pharmacologic, diagnostic, and clinical perspectives.

Beyond clinical and technical outcomes, the review reveals significant benefits to organizational culture and safety climate when interprofessional collaboration is robust. Healthcare settings with active multidisciplinary committees, shared training programs, and routine interdepartmental briefings reported improved teamwork, reduced interdepartmental conflict, and greater collective accountability for infection outcomes. These cultural shifts support sustained compliance with infection prevention strategies, as staff recognize their shared role in maintaining a safe healthcare environment. Conversely, departments operating in silos exhibited fragmented workflows, inconsistent adherence to protocols, and reduced transparency during outbreaks.

The findings also underscore the essential role of leadership and governance in enabling collaboration. Effective infection control requires institutional commitment: adequate staffing, resource availability, investment in training, and reinforcement of accountability structures. Leadership support ensures that infection control is prioritized as an organizational goal rather than delegated solely to frontline staff or infection control specialists. Administrative involvement is especially important during high-risk events or outbreaks, where rapid coordination across departments can significantly reduce secondary transmission.

Despite these strengths, the evidence also highlights several challenges. Many healthcare institutions struggle with entrenched departmental silos, workload pressures, and limited cross-training opportunities. Interprofessional collaboration requires dedicated time, resources, and structured processes—elements not always prioritized in resource-constrained or high-acuity settings. Some studies also reported resistance to shared auditing or multidisciplinary decision-making, particularly in environments where hierarchical or discipline-centered cultures persist. Without leadership intervention and cultural realignment, these barriers may inhibit the success of collaborative infection prevention programs.

The review further identifies gaps in research. Much of the existing literature focuses on acute-care hospitals, with limited evidence from primary care, rehabilitation centers, and community health settings—areas where different patterns of collaboration may emerge. Few studies evaluate long-term sustainability or cost–benefit analyses of collaborative interventions. Moreover, there is a need for rigorous comparative studies to identify which specific collaborative models yield the greatest improvements across various clinical contexts.

Overall, the findings of this integrative review underscore that infection control is strengthened most significantly when supported by system-wide, interprofessional collaboration. Aligning departmental workflows, standardizing communication channels, and fostering shared ownership of infection outcomes are key drivers of success. As healthcare systems continue to face emerging infectious threats and rising antimicrobial resistance, developing and sustaining these collaborative structures will be essential for protecting patients, staff, and communities.

Conclusion

This integrative review highlights that effective infection control is not the result of isolated departmental actions, but rather the product of coordinated, system-level collaboration across healthcare units. The synthesis of evidence from 112 studies demonstrates that interprofessional collaboration enhances infection prevention through shared protocols, real-time data exchange, multidisciplinary decision-making, and unified adherence to evidence-based practices. When nursing, physicians, laboratory services, pharmacy, environmental services, radiology, dentistry, rehabilitation teams, CSSD, and administrative leadership work within integrated frameworks, infection-related outcomes improve significantly.

Multidisciplinary approaches consistently yielded reductions in healthcare-associated infections, improved antimicrobial stewardship outcomes, and strengthened compliance with key preventive measures. These improvements were further supported by enhanced communication culture, technology-enabled surveillance systems, and leadership-engaged governance structures. The findings reinforce that infection prevention is a dynamic, collective responsibility requiring continuous interaction among all departments involved in patient care and institutional operations.

However, sustaining collaborative infection control programs requires addressing barriers such as departmental silos, limited training, workload pressures, and inconsistent communication pathways. Investment in leadership-driven policy alignment, interprofessional education, digital integration, and shared accountability frameworks is critical to maintaining long-term improvements. Furthermore, future research should explore collaborative models in non-hospital settings, assess cost-effectiveness, and evaluate the sustainability of multidisciplinary strategies over time.

In conclusion, optimizing infection control in modern healthcare environments depends on the strength and quality of interprofessional collaboration. By integrating the expertise and responsibilities of diverse departments, healthcare institutions can build more resilient, safer systems capable of preventing infections, reducing antimicrobial resistance, and improving patient outcomes in an increasingly complex healthcare landscape.

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