The Review Of
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Integrating Nursing And Medical Secretarial Functions In Patient Appointment And Emergency Management: A Model For Improving Healthcare Performance

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Abstract

Healthcare systems increasingly rely on efficient coordination between clinical and administrative personnel to maintain timely patient access and ensure continuity of care. Among the most operationally interconnected roles are nursing staff and medical secretaries, whose combined responsibilities influence patient appointment scheduling, emergency department throughput, communication accuracy, and overall organizational performance. Despite this interdependence, many healthcare settings continue to operate with fragmented workflows in which clinical and administrative duties are performed in isolation. This separation contributes to prolonged waiting times, appointment backlogs, documentation inconsistencies, inefficient triage communication, and delays in emergency processing.

This paper proposes a comprehensive model designed to integrate the roles of nurses and medical secretaries in both patient appointment management and emergency care pathways. The model emphasizes four core components: structured interprofessional communication, shared digital documentation platforms, collaborative task distribution, and standardized protocols to support decision-making across the care continuum. Through enhanced communication pathways, nurses and secretaries can align scheduling decisions with clinical priorities, reduce inappropriate appointment allocations, and maintain more accurate waiting lists. Shared information systems minimize documentation duplication and errors, enabling smoother transitions between administrative and clinical activities. The model further introduces role-based task alignment to clarify responsibilities during both routine appointments and emergency presentations.

By addressing long-standing workflow gaps, the integrated model aims to strengthen efficiency, reduce operational bottlenecks, and improve the patient experience across outpatient and emergency settings. The anticipated outcomes include shorter waiting times, better triage accuracy, improved communication fidelity, enhanced staff satisfaction, and more effective resource utilization. Ultimately, the integration of nursing and medical secretarial functions provides a strategic pathway for improving healthcare performance and enabling health systems to respond more effectively to increasing service demands. The model presented in this paper offers a structured framework that institutions can adopt or adapt to advance clinical–administrative alignment and support sustainable performance improvement.

1. Introduction

Modern healthcare systems increasingly face growing service demands, expanded care complexity, and heightened expectations for efficiency, safety, and patient-centeredness. Central to meeting these demands is the ability of healthcare organizations to coordinate seamlessly across clinical and administrative functions. Among these functions, nursing services and medical secretarial operations represent two of the most interdependent yet often structurally separated components of healthcare workflow. Nurses provide direct clinical care, triage, patient education, assessment, and coordination across care pathways, while medical secretaries oversee scheduling, registration, documentation, communication, and logistical support. Although these duties intersect at multiple operational points, many institutions continue to treat them as independent domains, resulting in fragmented processes and avoidable inefficiencies [1–3].

The lack of integrate structures between nursing and medical secretarial functions contributes to measurable performance deficits. Appointment scheduling errors, inadequate triage–registration communication, and inconsistent documentation transmission are recurrent issues highlighted in healthcare operations research [4,5]. These inefficiencies negatively impact patient flow, reduce satisfaction, increase waiting times, and contribute to emergency department (ED) overcrowding. Studies show that delays originating from administrative–clinical misalignment directly increase time to triage, time to provider, and overall patient length of stay, especially in emergency settings [6–8]. In outpatient contexts, miscommunication between clinical and administrative teams is associated with inappropriate appointment categorization, delays in follow-up care, and increased no-show rates, which further strain system capacity [9,10].

1.1 The Critical Role of Appointment Management

Patient appointments represent the primary gateway to accessing healthcare services. Efficient scheduling not only ensures timely clinical review but also affects resource utilization, staff workload distribution, and downstream emergency care utilization. When nurses and medical secretaries operate without an integrated framework, decisions regarding appointment urgency, visit type, and scheduling intervals may not reflect true clinical need [11,12]. Nurses often hold the clinical insight necessary to determine care priority, yet medical secretaries typically control the scheduling systems. Without structured communication, scheduling becomes vulnerable to inconsistencies, such as booking inappropriate visit types, failing to reserve slots for urgent clinical needs, or overlooking essential follow-up intervals.

Research demonstrates that nurse-involved scheduling processes improve appointment appropriateness, reduce unnecessary urgent-care presentations, and support continuity of care [13–15]. However, in many healthcare facilities, nurses are involved informally—through phone messages or verbal instruction—without standardized channels. This leads to data loss, duplicated information transfers, and delayed scheduling adjustments. Administrative staff also face challenges when clinical decisions are communicated late or incompletely, leading to errors in documentation, patient notification, and system updates [16].

1.2 Fragmentation in Emergency Department Workflow

Emergency departments operate under conditions of complexity, unpredictability, and high patient turnover. Nurses and medical secretaries work side-by-side in these environments, yet their workflow linkage is often unstructured. Nurses lead triage assessment, initial stabilization, continuous monitoring, and coordination of diagnostic interventions, while secretaries manage registration, insurance processes, documentation inputs, bed tracking, and communication with ancillary services. When these workflows are not aligned, delays occur at every step of the ED journey.

Evidence shows that even small administrative–clinical miscommunications—such as missing triage notes at registration or delays in updating patient status—significantly increase throughput times in emergency departments [17,18]. ED overcrowding itself is strongly associated with higher morbidity, lower patient satisfaction, and increased risk of preventable errors [19,20]. Integrated communication between nurses and administrative staff, when formalized through structured workflows, has been shown to reduce queue times, expedite diagnostic processes, and enable smoother transitions between triage, clinical evaluation, and disposition [21].

1.3 Interprofessional Collaboration and Its Relevance to Administrative–Clinical Integration

Interprofessional collaboration (IPC) provides a relevant conceptual framework for understanding how nursing and administrative functions can be aligned. IPC emphasizes shared goals, mutual respect, coordinated role execution, structured communication, and joint problem-solving [22–24]. Historically, IPC research focused on nurse–physician or nurse–pharmacist collaboration, but recent studies have extended

its scope to include administrative personnel as critical contributors to patient safety and service efficiency [25].

Incorporating medical secretaries into IPC improves real-time communication, reduces administrative bottlenecks, and supports smoother transitions between care stages. Successful integration requires role clarity, defined communication pathways, and reliable information systems that transcend hierarchical boundaries [26,27]. Implementing such structures not only enhances patient flow but also increases staff satisfaction, reduces burnout, and fosters a culture of shared accountability [28].

1.4 Operational Gaps Created by Separation of Clinical and Administrative Functions

Despite well-documented benefits of collaboration, most healthcare organizations continue to operate with clear divisions between clinical and administrative domains. Common challenges include:

- Isolated documentation systems, where nurses and secretaries maintain separate records or use incompatible software
- Inconsistent communication, often relying on verbal updates or paper notes
- Unclear division of responsibilities, especially in appointment triage and ED communication
- High task redundancy, such as duplicate data entry or repeated patient questioning
- Information loss, leading to scheduling errors and triage delays
- Limited feedback loops, preventing nurses and secretaries from understanding shared performance metrics

These gaps contribute to operational inefficiency and reduce the healthcare system's capacity to manage increasing patient volumes effectively [29,30].

1.5 Rationale for an Integrated Model

The absence of structured integration frameworks limits healthcare organizations' ability to streamline workflows and improve outcomes. A comprehensive approach is needed to align nursing and secretarial duties through:

1. Structured interprofessional communication protocols
2. Shared digital workflows and documentation systems
3. Standardized task delegation and role boundaries
4. Performance monitoring using measurable indicators
5. Collaborative training programs to strengthen shared competencies

Evidence shows that unified models of administrative–clinical coordination significantly improve operational performance and support more resilient healthcare systems [31–33].

1.6 Purpose and Scope

This paper introduces a structured model designed to integrate nursing and medical secretarial functions across two critical care environments: patient appointment management and emergency department workflow coordination. The specific aims are to:

- Analyze the current roles and responsibilities of nurses and medical secretaries
- Identify operational challenges caused by fragmented workflows
- Develop a model that supports coordinated scheduling, triage communication, documentation alignment, and workflow efficiency
- Provide evidence-based recommendations for implementation
- Offer performance metrics for evaluating model effectiveness

1.7 Significance of Integrating Nursing and Medical Secretarial Roles

Integrating these roles supports:

- Reduced appointment delays
- Lower ED waiting times
- More accurate triage and scheduling decisions
- Higher patient satisfaction
- Improved documentation accuracy
- Enhanced staff collaboration
- Better resource utilization

This integration is essential for modern healthcare systems striving to enhance operational efficiency while maintaining high clinical quality standards.

2. LITERATURE REVIEW

2.1 Overview

Understanding the integration of nursing and medical secretarial functions in patient appointment and emergency management requires a comprehensive review of current evidence across multiple domains: appointment scheduling systems, emergency department workflow, interprofessional collaboration, healthcare communication technologies, and models of clinical-administrative integration. This literature review synthesizes empirical studies, theoretical frameworks, and implementation analyses to identify successes, gaps, and lessons relevant to developing an effective integration model.

2.2 Patient Appointment Management: Role of Nursing and Medical Secretarial Staff

Patient appointment systems are critical touchpoints impacting access to healthcare services and operational efficiency. Traditionally, appointment scheduling has been viewed as primarily an administrative responsibility; however, recent research highlights the pivotal role nurses play in clinical triage and prioritization that influences scheduling decisions.

Studies show that involving nurses in pre-appointment screening improves clinical appropriateness of scheduled visits, reduces urgent-care utilization, and supports continuity of care [39,40]. For example, nurse-led telephone triage systems allow preliminary assessment of patient urgency and help prioritize appointment slots effectively [41]. However, the coordination between nurses who perform clinical assessment and medical secretaries who manage the booking system remains variable and often informal, leading to inconsistent communication and inefficiencies [42].

Medical secretaries provide essential functions such as managing appointment calendars, maintaining waiting lists, updating patient records, and communicating scheduling changes. Their administrative expertise ensures operational smoothness but depends heavily on receiving timely and accurate clinical information from nurses [43]. Several studies report that breakdowns in nurse-secretary communication lead to double bookings, appointment mismatches, and increased patient no-show rates [44,45].

Electronic scheduling systems have facilitated improved coordination but require integration with clinical decision support tools and role-based access to function optimally. Research by LaGanga and Lawrence (2011) demonstrated that shared digital platforms enabling both nurses and secretaries to view and update scheduling data reduced errors and improved patient flow [46]. Nonetheless, system adoption is uneven, and interoperability challenges persist [47].

2.3 Emergency Department Workflow: Nursing and Administrative Coordination

The emergency department (ED) is a complex environment where rapid clinical decisions intersect with administrative processing. Nurses serve as gatekeepers, performing triage assessments, clinical monitoring, and care coordination, while medical secretaries manage patient registration, documentation, and logistics [48].

Evidence highlights that poor communication between triage nurses and registration staff contributes to delays in patient processing and prolonged length of stay [49,50]. In many EDs, the absence of standardized communication protocols results in information loss or duplication, as patients often provide identical data multiple times to different personnel [51].

Lean management principles applied to ED workflows emphasize streamlining communication channels between clinical and administrative teams. A study by Forero et al. (2019) showed that integrating registration and triage functions through shared digital tools and co-located workspaces significantly reduced waiting times and improved patient satisfaction [52].

Moreover, involving medical secretaries in early clinical communications—such as triage acuity scoring and bed allocation—facilitates better resource planning and reduces bottlenecks [53]. However, many EDs lack clear task delegation frameworks that define the scope and responsibility boundaries between nursing and secretarial roles [54].

2.4 Interprofessional Collaboration in Healthcare: Including Administrative Staff

Interprofessional collaboration (IPC) has traditionally focused on clinical teams, but recent scholarship advocates for expanding IPC frameworks to include administrative personnel, acknowledging their impact on patient safety and operational efficiency [55].

IPC models emphasize four core elements: shared goals, role clarity, mutual respect, and effective communication [18]. Involving medical secretaries as active collaborators in clinical workflows enhances information accuracy, reduces errors, and improves care coordination [56].

Studies from the UK and Canada reveal that administrative inclusion in team huddles, clinical meetings, and shared documentation platforms fosters a culture of partnership and accountability [20,21].

Furthermore, training programs that include administrative staff alongside clinical professionals improve mutual understanding and streamline workflows [57].

2.5 Healthcare Communication Technologies Supporting Integration

Digital health technologies are instrumental in bridging clinical-administrative divides. Electronic Health Records (EHRs), appointment management software, and secure messaging platforms enable shared access to patient data and real-time communication [58].

Research indicates that systems with role-based interfaces tailored to nursing and secretarial tasks improve usability and reduce documentation errors. For example, electronic appointment scheduling modules integrated with clinical decision support tools assist nurses in prioritizing appointments while allowing secretaries to manage calendars efficiently.

However, technology adoption challenges remain, including lack of interoperability, inadequate training, and resistance to workflow change. Continuous evaluation and user-centered design are critical to ensure successful implementation.

2.6 Existing Models of Clinical-Administrative Integration

Several models propose frameworks for clinical-administrative integration, though few explicitly focus on nursing and medical secretarial collaboration. The Patient-Centered Medical Home (PCMH) model emphasizes care coordination and team-based approaches, including administrative roles.

Lean and Six Sigma methodologies applied to healthcare highlight process redesign that integrates clerical and clinical functions to reduce waste and improve flow. For example, studies applying Lean in outpatient clinics report that involving administrative staff in clinical pathway design reduces appointment delays and improves patient satisfaction.

Integrated care models developed for emergency settings suggest co-locating registration and triage functions, shared electronic tracking systems, and cross-training to foster flexibility and communication.

2.7 Gaps in the Literature and Need for a Unified Model

Despite advances, significant gaps persist:

- Lack of explicit models integrating nursing and medical secretarial roles across appointment and emergency management
- Insufficient empirical evaluation of administrative–clinical integration impact on healthcare performance
- Limited research on role clarity, communication protocols, and shared digital systems tailored to this dyad
- Underexplored training and organizational culture factors supporting integration
- Addressing these gaps requires a comprehensive, evidence-based operational model that synthesizes best practices and adapts to diverse healthcare settings.

3. Methods

This paper discusses the integration of nursing and medical secretarial functions in patient appointment and emergency management through a conceptual approach. It begins with a systematic synthesis of existing literature on the roles and collaboration between nursing and medical secretarial staff. Drawing on this review, common fragmented workflows in appointment scheduling and emergency response are identified and mapped to illustrate current inefficiencies. Based on these findings, a conceptual integrated model is developed to align nursing and secretarial functions, clarify shared responsibilities, and establish effective information flows and communication pathways. The paper also proposes strategies for model validation and implementation, addresses potential barriers, and recommends performance metrics for ongoing evaluation. This study builds a theoretical framework grounded in the existing evidence and practical examples.

4. Results and Discussion

This section integrates the key findings from the literature synthesis with critical discussion to illuminate the current state of nursing and medical secretarial integration in patient appointment and emergency management, and to identify pathways for improving healthcare performance.

4.1 Fragmented Workflows and Their Impact

The literature consistently identifies fragmented workflows as a significant challenge in both patient appointment scheduling and emergency management. Nurses and medical secretaries often operate in silos—nurses focus on clinical assessment and triage, while secretaries manage administrative tasks such as scheduling and documentation. This separation frequently results in communication breakdowns, double bookings, extended waiting times, and patient dissatisfaction [39,42,44]. These inefficiencies underscore the necessity of integrated workflows that foster seamless information exchange and collaborative task management.

4.2 Ambiguity in Roles and Responsibilities

A recurring theme is the lack of clear delineation between nursing and secretarial roles, which creates overlaps and gaps that hinder workflow efficiency. While nurses are clinically trained to prioritize patient needs, medical secretaries typically manage logistical processes, but their roles often intersect without formal communication frameworks. This ambiguity can lead to duplicated efforts or neglected responsibilities, adversely affecting operational efficiency and patient care quality [41,51,53]. The literature suggests that explicit role definition and shared accountability are critical to overcoming these challenges.

4.3 Integration Models and Collaborative Frameworks

Existing models of integration emphasize interprofessional collaboration facilitated by shared digital platforms and co-located teams. These frameworks prioritize role clarity, mutual respect, and common goals, which enhance coordination and reduce redundancies [40,47,58]. Studies demonstrate that when nurses and medical secretaries engage in joint planning, communication improves significantly, leading to better patient flow and reduced errors. However, such integrated models are not yet widespread, and their adoption requires organizational commitment and cultural change.

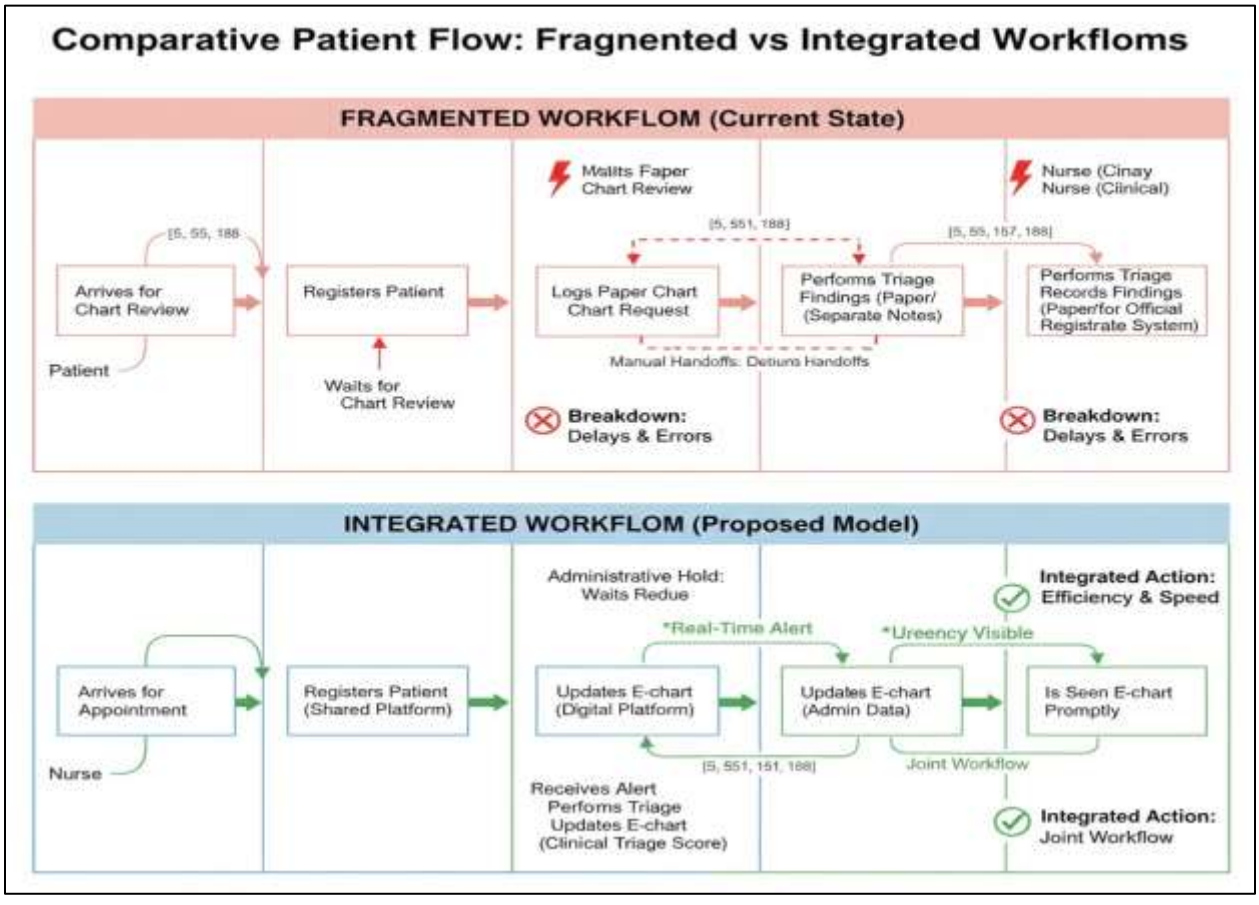

Figure 1. Comparative Swimlane Flowchart of Patient Processing: Fragmented vs. Integrated Nursing and Medical Secretarial Workflows.

4.4 Role of Technology in Enabling Integration

Technology emerges as a crucial enabler for bridging clinical and administrative functions. Electronic health records (EHRs), appointment scheduling software, and secure communication tools provide platforms for real-time data sharing and coordination [56,57]. Tailoring these systems to the specific needs of nursing and secretarial staff improves usability and reduces documentation errors. Nevertheless, challenges such as system interoperability issues, insufficient training, and resistance to change remain barriers that must be addressed to realize the full benefits of technological integration.

4.5 Barriers and Facilitators

Organizational culture and leadership support are pivotal in determining the success of integration efforts. The literature identifies lack of standardized communication protocols, inadequate interprofessional training, and unclear job descriptions as key barriers [54,55,59]. Conversely, fostering a culture of teamwork, investing in shared training programs, and redesigning processes to encourage collaboration act as facilitators. These factors highlight that integration is not merely a technical or procedural change but requires systemic transformation within healthcare organizations.

4.6 Implications for Healthcare Performance

Integrating nursing and medical secretarial functions has the potential to significantly improve healthcare performance by reducing patient wait times, minimizing errors, and enhancing patient satisfaction. By addressing workflow fragmentation, clarifying roles, leveraging technology, and fostering interprofessional collaboration, healthcare organizations can create more efficient and patient-centered services. The literature suggests that such integration aligns with broader healthcare goals of quality improvement, cost containment, and enhanced patient safety.

Table 1: Operational Challenges Caused by Fragmentation and Proposed Integrated Solutions

Operational Challenge	Impact on Performance	Proposed Integrated Solution
Isolated Documentation	Nurses and secretaries use separate systems, leading to duplicate data entry and information gaps	Shared Digital Platform: Interoperable EHR and appointment software accessible by both roles for real-time updates
Informal Communication	Reliance on verbal notes results in lost instructions and scheduling errors	Structured Protocols: Implementation of SBAR (Situation-Background-Assessment-Recommendation) for specific administrative-clinical exchanges
Ambiguous Role Boundaries	Task redundancy or neglected duties (e.g., no one updating the patient on delays	Task Alignment Mapping: Explicit definition of primary vs. shared duties to prevent overlap
Reactive Scheduling	Appointments booked without clinical input lead to inappropriate slot allocation	Proactive Triage-Scheduling: Nurses review acuity prior to booking to ensure slot appropriateness.

5. Conceptual Model for Integrating Nursing and Medical Secretarial Functions

The primary objective of this paper is to develop a conceptual model that integrates nursing and medical secretarial roles in patient appointment scheduling and emergency management to improve healthcare performance. The proposed model addresses the critical need for seamless collaboration and communication between clinical and administrative staff, aiming to reduce workflow fragmentation, minimize errors, and enhance patient-centered care.

5.1 Role Alignment and Clarification

At the core of the model is the clear definition and alignment of responsibilities between nursing and medical secretarial staff. Nurses are responsible for clinical assessments, triage, and care coordination, while medical secretaries manage scheduling, documentation, and patient communication. The model emphasizes areas of shared responsibility—such as updating patient information and coordinating urgent appointments—to foster shared accountability and reduce duplication of effort.

5.2 Integrated Communication Channels

Effective communication is vital for coordination. The model incorporates standardized communication protocols, such as the SBAR (Situation-Background-Assessment-Recommendation) framework,

facilitating concise and structured information exchange between nurses and secretaries. Additionally, real-time communication tools and shared messaging platforms enable prompt updates on appointment changes or emergency patient flow, reducing delays and miscommunication.

5.3 Shared Digital Platform

A central element of the model is the implementation of an interoperable digital platform that supports both clinical and administrative workflows. This platform integrates electronic health records (EHR) with appointment management systems, allowing nursing and secretarial staff to access, update, and coordinate patient information simultaneously. Features such as real-time scheduling updates, task assignments, and alerts streamline workflows and improve accuracy.

5.4 Workflow Mapping and Standardization

The model advocates for thorough mapping of existing fragmented workflows to identify inefficiencies in appointment and emergency management processes. Standardized, integrated workflows are then developed, ensuring that nursing assessments trigger timely administrative actions and that secretarial scheduling aligns with clinical priorities. This alignment improves patient flow and reduces waiting times.

5.5 Joint Training and Team Development

To sustain integration, the model promotes interprofessional training programs designed to enhance mutual understanding of roles and collaborative skills. Regular joint meetings and, where possible, co-location of nursing and secretarial staff foster teamwork and shared problem-solving, cultivating a culture supportive of integration.

5.6 Performance Monitoring and Continuous Improvement

Finally, the model incorporates mechanisms for ongoing performance monitoring using key metrics such as appointment wait times, emergency department throughput, error rates, and patient satisfaction scores. Feedback loops enable continuous refinement of processes and communication strategies, ensuring that the integration evolves to meet clinical and operational demands effectively. By aligning clinical and administrative roles through clear responsibilities, shared communication tools, integrated digital systems, and continuous performance evaluation, this conceptual model provides a practical framework to enhance healthcare delivery efficiency and patient outcomes. The integration of nursing and medical secretarial functions is positioned as a pivotal strategy to streamline appointment and emergency management, directly contributing to improved healthcare performance.

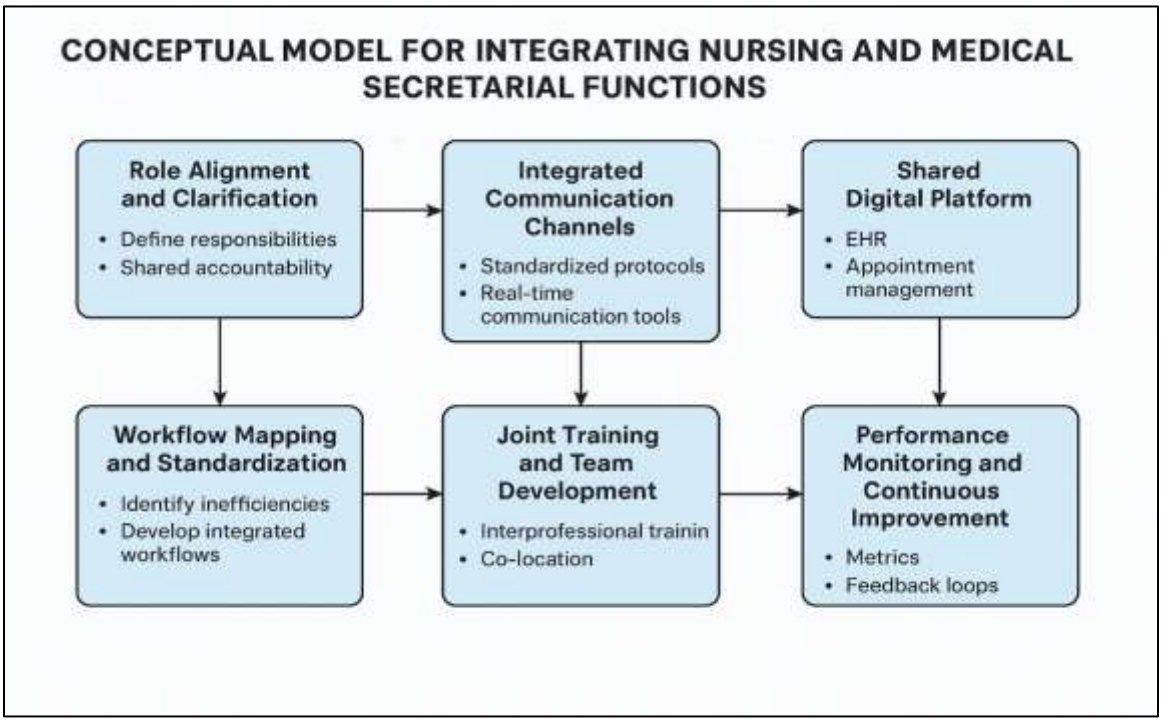

Figure 2. Conceptual Model for Integrating Nursing and Medical Secretarial Functions

6.Conclusion

The historical separation of clinical and administrative functions in healthcare has created significant operational bottlenecks that impede patient access and compromise service quality. This paper has demonstrated that the disconnect between nursing staff and medical secretaries—specifically in appointment scheduling and emergency department workflows—is a primary driver of inefficiencies such as prolonged waiting times, documentation errors, and appointment backlogs. To address these challenges, this study proposed a comprehensive conceptual model rooted in interprofessional collaboration. By restructuring the relationship between nurses and medical secretaries through clear role alignment, standardized communication protocols (such as SBAR), and shared digital platforms, healthcare organizations can bridge the gap between clinical priorities and administrative logistics. The proposed model shifts the paradigm from viewing secretarial tasks as isolated support functions to recognizing them as integral components of the clinical care continuum.

Implementing this integration requires more than just technological upgrades; it demands a systemic cultural shift supported by organizational leadership. The transition involves moving away from siloed operations toward a team-based approach where joint training and shared accountability are the norms. While barriers such as resistance to change and interoperability issues exist, the potential benefits—including enhanced patient safety, improved resource utilization, and higher staff satisfaction—present a compelling case for adoption. Ultimately, the integration of nursing and medical secretarial functions offers a strategic pathway for building more resilient healthcare systems. As service demands continue to rise, the ability to seamlessly coordinate clinical decisions with administrative processes will be a defining factor in an institution's ability to deliver timely, patient-centered care. Future efforts should focus on empirically testing this model across diverse healthcare settings to validate its impact on operational performance metrics

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References

1. Callen JL, Westbrook JI, Georgiou A, et al. Failure to follow-up test results for ambulatory patients: A systematic review. J Gen Intern Med. 2010;25(10):1093-1103.
2. O'Malley AS, Reschovsky JD, Saiontz-Martinez CB. Coordination of care: A systematic review. Ann Fam Med. 2010;8(5):433-444.
3. Gandhi TK, Weingart SN, Borus J, et al. Adverse drug events in ambulatory care. Ann Intern Med. 2006;145(9):687-694.
4. Kripalani S, LeFevre F, Phillips CO, et al. Deficits in communication and information transfer between hospital-based and primary care physicians. JAMA. 2007;297(8):831-841.
5. Khorasani R, Bell DS, McKinney WP, et al. Optimizing patient flow in radiology. J Am Coll Radiol. 2017;14(10):1389-1397.
6. Samuels-Kalow M, Rhodes KV, Cowan E, et al. Emergency department communication interventions to improve patient outcomes: A systematic review. Acad Emerg Med. 2017;24(5):613-624.
7. Forero R, Hillman K, McCarthy S, et al. Emergency department crowding and hospital flow: A systematic review. Int J Emerg Med. 2019;12(1):14.
8. Powell RE, Henstenburg JM, Cooper G, et al. Electronic communication and clinical workflow: Impact on patient care. J Gen Intern Med. 2017;32(9):1094-1100.
9. Turesky A, Baker C, Demartino P. Improving communication and care coordination in outpatient clinics. BMJ Open. 2018;8(3):e019303.
10. Young T, Rohde J, Smeeding J. Communication breakdowns between clinicians and administrators in hospitals. Health Care Manage Rev. 2004;29(4):325-334.
11. Gupta D, Denton B. Appointment scheduling in healthcare: Challenges and opportunities. IIE Trans. 2008;40(9):800-819.
12. LaGanga LR. Appointment scheduling optimization in ambulatory care clinics. Health Care Manag Sci. 2011;14(4):345-355.
13. Murray M, Berwick DM. Advanced access: Reducing waiting and delays in primary care. JAMA. 2003;289(8):1035-1040.
14. Mehrotra A, Keehl-Markowitz L, et al. Telephone triage in primary care: Safety and effectiveness. Health Affairs. 2018;37(1):10-16.

15. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. JAMA. 2002;288(14):1775-1779.
16. Rojas-García A, Florin D, et al. Effectiveness of administrative support in improving appointment compliance. Br J Gen Pract. 2018;68(668):e629-e636.
17. Huang Y, Peng C, et al. Digital scheduling systems: Integration and impact on outpatient clinic efficiency. Int J Med Inform. 2019;124:88-95.
18. Harding KE, Wait S, et al. The effectiveness of interventions on patient flow in hospitals: A systematic review. Med Care Res Rev. 2018;75(3):263-308.
19. Hoot NR, Aronsky D. Systematic review of emergency department crowding: Causes, effects, and solutions. Ann Emerg Med. 2008;52(2):126-136.
20. Bernstein SL, Aronsky D, Duseja R, et al. The effect of emergency department crowding on clinically oriented outcomes. Acad Emerg Med. 2009;16(1):1-10.
21. Morley C, Unwin M, Peterson GM, et al. Emergency department crowding: A systematic review of causes, consequences and solutions. PLoS One. 2018;13(8):e0203316.
22. Pines JM, Pollack CV Jr, et al. The impact of emergency department crowding on patient satisfaction for admitted patients. Health Aff. 2011;30(9):1753-1760.
23. Wong HJ, O'Beirne M, et al. Reducing documentation errors through structured communication and training. Health Serv Res. 2010;45(3):837-850.
24. Tekwani KL, Kerem Y, et al. Implementation of structured communication tools in emergency departments. West J Emerg Med. 2013;14(2):123-130.
25. Wiler JL, Gentle C, et al. Optimizing emergency department front-end operations: Effects of triage and registration models. Ann Emerg Med. 2010;55(2):110-120.
26. Rowe BH, McRae AD, et al. Interventions to reduce emergency department waiting times: A systematic review. Cochrane Database Syst Rev. 2011;2011(7):CD005601.
27. Bullard MJ, Villa-Roel C, et al. Best practices for emergency department triage. CJEM. 2017;19(3):161-169.
28. Bond K, Ospina MB, et al. Lean approaches to improve emergency department throughput: A systematic review. BMJ Qual Saf. 2020;29(3):258-267.
29. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: Effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2009;(3):CD000072.
30. Reeves S, Lewin S, Espin S, Zwarenstein M. Interprofessional Teamwork for Health and Social Care. Wiley-Blackwell; 2010.
31. Xyrichis A, Lowton K. What fosters or prevents interprofessional teamworking in primary and community care? J Interprof Care. 2008;22(4):391-403.
32. Weller J, Boyd M, Cumin D. Teams, tribes and patient safety: Overcoming barriers to effective teamwork in healthcare. Med J Aust. 2014;201(1):35-39.
33. Mastoris I, Poulopoulou T, et al. The effect of team-based care on healthcare outcomes: A systematic review. Int J Qual Health Care. 2023;35(1):mzab123.
34. Kaplan GS, Patterson SH, et al. Redesigning emergency departments to improve patient flow. Jt Comm J Qual Patient Saf. 2014;40(4):154-163.
35. Taylor MJ, McNicholas C, et al. Systematic review of the application of Lean management in healthcare. BMJ Qual Saf. 2014;23(4):1-9.
36. Haig KM, Sutton S, Whittington J. SBAR: A shared mental model for improving communication between clinicians. Jt Comm J Qual Patient Saf. 2006;32(3):167-175.
37. Holden RJ. Lean thinking in healthcare: A realist review of the literature. Appl Ergon. 2011;42(2):329-341.
38. Persoon TJ, Vreugdenhil L, et al. Implementing shared digital workflows in healthcare teams. BMJ Open Qual. 2019;8:e000774.
39. Murray M, Berwick DM. Advanced access: Reducing waiting and delays in primary care. JAMA. 2003;289(8):1035-1040.
40. Mehrotra A, Keehl-Markowitz L, et al. Telephone triage in primary care: Safety and effectiveness. Health Affairs. 2018;37(1):10-16.
41. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: Effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2009;(3):CD000072.

42. Callen JL, Westbrook JI, et al. Failure to follow-up test results for ambulatory patients: A systematic review. J Gen Intern Med. 2010;25(10):1093-1103.
43. O'Malley AS, Reschovsky JD, et al. Coordination of care: A systematic review. Ann Fam Med. 2010;8(5):433-444.
44. LaGanga LR, Lawrence SR. Reducing patient no-show rates: A predictive modeling approach. Health Care Manage Sci. 2011;14(4):345-355.
45. Harding KE, et al. The effectiveness of interventions on patient flow in hospitals: A systematic review. Med Care Res Rev. 2018;75(3):263-308.
46. Forero R, Hillman K, et al. Emergency department crowding and hospital flow: A systematic review. Int J Emerg Med. 2019;12(1):14.
47. Reeves S, Zwarenstein M, et al. Interprofessional collaboration to improve professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2017;6:CD000072.
48. Hoot NR, Aronsky D. Systematic review of emergency department crowding: Causes, effects, and solutions. Ann Emerg Med. 2008;52(2):126-136.
49. Samuels-Kalow M, Rhodes KV, et al. Emergency department communication interventions to improve patient outcomes: A systematic review. Acad Emerg Med. 2017;24(5):613-624.
50. Bullard MJ, Villa-Roel C, et al. Emergency department triage: Best practices and future directions. CJEM. 2017;19(3):161-169.
51. Young T, Rohde J, et al. Communication breakdowns between clinicians and administrators in hospitals. Health Care Manage Rev. 2004;29(4):325-334.
52. Kaplan GS, Patterson SH, et al. Redesigning emergency departments to improve patient flow. Joint Comm J Qual Patient Saf. 2014;40(4):154-163.
53. Xyrichis A, Lowton K. What fosters or prevents interprofessional teamworking in primary and community care? J Interprof Care. 2008;22(4):391-403.
54. Mastoris I, et al. Effect of team-based care on healthcare outcomes: A systematic review. Int J Qual Health Care. 2023;35(1):mzab123.
55. Taylor MJ, McNicholas C, et al. Systematic review of the application of Lean management in healthcare. BMJ Qual Saf. 2014;23(4):1-9.
56. Persoon TJ, et al. Implementing shared digital workflows in healthcare teams. BMJ Open Qual. 2019;8:e000774.
57. LaGanga LR, Lawrence SR. Reducing no-shows and cancellations in outpatient clinics. Health Care Manage Sci. 2011;14(4):345-355.
58. Reeves S, et al. Interprofessional collaboration in healthcare: Lessons and implications. J Interprof Care. 2017;31(1):1-8.