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ENHANCING INTEGRATED CARE: A REVIEW OF COLLABORATIVE MANAGEMENT STRATEGIES IN NURSING, PHARMACEUTICAL, PARAMEDIC, AND LABORATORY SERVICES

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ABSTRACT

Integrated care has emerged as a critical approach for enhancing patient outcomes, improving healthcare efficiency, and fostering a patient-centered care environment. This review article explores collaborative management strategies across four key healthcare departments: nursing, pharmaceutical, paramedic, and laboratory services. By analyzing interdisciplinary team frameworks, communication protocols, workflow integration, and quality improvement initiatives, we highlight the positive impacts of integrated care on clinical outcomes, patient satisfaction, and operational efficiency. Key findings reveal that collaborative management fosters better continuity of care, reduces redundancy, and enhances timely medical responses, ultimately supporting healthcare systems in addressing complex patient needs. However, challenges such as systemic barriers, cultural differences, and information-sharing constraints hinder full implementation. This review proposes solutions to these challenges and outlines recommendations for future research and policy to strengthen integrated care models. The findings underscore the value of interdepartmental collaboration as a means to optimize patient-centered care and healthcare sustainability.

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INTRODUCTION

In modern healthcare systems, the complexity and multifaceted nature of patient needs have intensified the demand for integrated care models. These models emphasize interdepartmental collaboration, combining the expertise of diverse healthcare professionals to enhance patient outcomes and streamline care delivery (Kodner & Spreeuwenberg, 2002). Integrated care aims to dismantle traditional silos, enabling a cohesive approach that links nursing, pharmaceutical, paramedic, and laboratory services. Each of these departments plays a critical role in the patient care continuum, and their integration is essential to meet the growing demands for efficient, patient-centered healthcare. Nursing is often the backbone of patient care, providing direct, round-the-clock support, administering medications, monitoring patient conditions, and coordinating with other departments to ensure timely interventions (Aiken et al., 2012). Effective nursing care is critical for patient recovery, especially in high-risk cases, making it an essential component in integrated care models. Pharmaceutical services play a crucial role in medication management, optimizing therapy, and

Pharmacists' contributions to integrated care have been shown to improve patient safety, particularly by preventing medication errors and enhancing adherence to treatment plans (Kucukarslan et al., 2011). This collaboration between pharmaceutical and nursing services highlights the potential benefits of a unified care approach. Paramedic services provide essential emergency care, stabilizing patients before they reach hospital settings, and ensuring that patient information is accurately communicated to hospital staff. Paramedics' role in integrated care is critical, especially in emergency settings, where collaboration with hospital teams can significantly improve continuity of care (Blacker et al., 2009). The seamless integration of paramedic services into healthcare systems has been associated with reduced mortality rates and enhanced patient outcomes. Laboratory services are another cornerstone of integrated care, providing diagnostic support that informs clinical decision-making and enhances treatment accuracy. By collaborating with other departments, laboratory services help reduce diagnostic delays and ensure that healthcare providers have access to timely and accurate information (Plebani, 2010). Studies have demonstrated that efficient

lack organizational barriers, limited resources, and interdepartmental communication gaps that can hinder effective collaboration (Ahgren & Axelsson, 2005). Additionally, cultural differences between departments, lack of standardized protocols, and issues related to information-sharing infrastructure pose significant obstacles (Goodwin et al., 2012). Addressing these challenges requires a focused approach to collaborative management that fosters communication, clarifies roles, and aligns departmental workflows toward common objectives. This review explores various collaborative management strategies that can foster integration across nursing, pharmaceutical, paramedic, and laboratory services. Through an analysis of interdisciplinary team structures, workflow integration techniques, and quality improvement initiatives, this article aims to highlight how integrated care can optimize patient-centered healthcare. By examining successful models and identifying the barriers to implementation, this review contributes to the development of practical frameworks for enhancing the integrated role of these departments in healthcare.

METHODOLOGY

This review examines recent literature on collaborative management strategies within integrated healthcare models, specifically focusing on the roles of nursing, pharmaceutical, paramedic, and laboratory services. A systematic search was conducted across major databases, including PubMed, CINAHL, Scopus, and Google Scholar, using keywords such as "integrated care," "collaborative management," "nursing services," "pharmaceutical services," "paramedic services," and "laboratory services." Studies published from 2015 onwards were prioritized to ensure relevance to contemporary healthcare practices. Inclusion criteria were defined to select peer-reviewed articles, clinical trials, case studies, and reviews discussing interdisciplinary collaboration in healthcare settings. Excluded were articles without clear relevance to integrated care, those lacking specific collaborative strategies, and studies outside of healthcare. Screening of abstracts was followed by a full-text review to confirm eligibility based on defined criteria. Data extraction focused on study objectives, methodology, key findings, and outcomes related to collaborative care models. An analysis was conducted to identify common themes, challenges, and best practices in integrating care across these departments. Findings were synthesized to highlight the impact of collaborative management on patient outcomes, operational efficiency, and healthcare quality. This approach provides a comprehensive overview of the evidence supporting integrated care models and identifies gaps for future research and development in healthcare integration.

Overview of Integrated Care Models: Integrated care models are designed to streamline healthcare delivery by fostering cooperation among diverse healthcare departments, thereby enhancing continuity of care, improving patient outcomes, and reducing inefficiencies. The goal of integrated care is to provide a coordinated, patient-centered approach that meets the complex needs of individuals across various health settings (Kodner & Spreeuwenberg, 2002). Several well-established models provide frameworks for achieving integrated care, each offering strategies to manage interdepartmental collaboration effectively. One widely recognized model is the Chronic Care Model (CCM), which focuses on managing chronic diseases by integrating community resources, healthcare systems, and self-management support for patients (Wagner et al., 1996). CCM highlights the importance of collaborative team-based care, particularly in primary and secondary care settings, as well as the use of technology, like electronic health records (EHRs), to enhance information sharing across departments. Another influential model is the Patient-Centered Medical Home (PCMH), which seeks to place patients at the center of care by coordinating services across multiple providers, including nursing, pharmacy, and laboratory services (Berenson et al., 2008). PCMH emphasizes the role of a primary care provider who

coordinates care, ensuring that all departments work together to meet

redundant services. The WHO Integrated Care Framework is another notable model that promotes integration across healthcare systems, aiming to deliver holistic and continuous care, particularly in low-resource settings (World Health Organization, 2016). The WHO framework encourages healthcare providers to address both clinical and social determinants of health, advocating for collaboration across healthcare departments and with community resources. This model has been instrumental in guiding healthcare systems in developing countries to adopt integrated approaches to address diverse patient needs effectively. These models underscore the necessity of interdepartmental collaboration, highlighting key elements such as shared responsibility, communication, and information exchange. Integrated care models often leverage technology to enable real-time data sharing, facilitating seamless communication across departments, including nursing, pharmacy, paramedic, and laboratory services. Implementing these models within healthcare systems can reduce delays in care, improve diagnostic accuracy, and ultimately lead to better patient outcomes. The evidence supporting these models suggests that well-coordinated, interdisciplinary care significantly enhances the quality and efficiency of healthcare delivery, making integrated care a crucial strategy for modern health systems.

Roles and Contributions of Each Department in Integrated Care:

In an integrated care system, various healthcare departments collaborate to ensure a seamless, patient-centered approach to care. Each department has specific roles and contributions, which, when aligned effectively, lead to improved patient outcomes, enhanced efficiency, and reduced healthcare costs. Below is an overview of the contributions of each core department—nursing, pharmaceutical, paramedic, and laboratory services—within an integrated care framework.

Nursing

- **Roles:** Nurses serve as primary patient care providers, overseeing patient monitoring, care coordination, and education. They are the frontline in ensuring timely interventions and in fostering communication between patients and other healthcare professionals.
- **Contributions:** Nursing staff play a vital role in patient assessment, care planning, and managing ongoing care. Their collaboration with other departments is essential for continuity, especially in managing complex cases or chronic diseases.

Pharmaceutical Services

- **Roles:** Pharmacists focus on medication management, including the preparation, dispensation, and monitoring of drugs. They ensure that prescribed therapies are safe and effective, collaborating closely with both nursing and medical staff.
- **Contributions:** Pharmaceutical services reduce adverse drug events by cross-verifying medications, optimizing therapy, and educating patients. Through close collaboration with other departments, they contribute to patient safety and adherence to treatment plans.

Paramedic Services

- **Roles:** Paramedics provide initial assessment, emergency stabilization, and transport of patients to healthcare facilities, often serving as the first responders in critical situations.
- **Contributions:** Paramedics enhance the continuity of care by accurately relaying patient information to hospital staff and preparing them for urgent care. Their role is crucial in minimizing delays and improving the handover process from pre-hospital to in-hospital care.

monitoring, and treatment planning.

- **Contributions:** Laboratory services support clinical decision-making by providing timely, accurate diagnostic information. Their coordination with other departments ensures that patients receive accurate and efficient care, reducing diagnostic delays and optimizing treatment outcomes.

Table 1. Roles and Contributions of Key Departments in Integrated Care

Department	Primary Roles	Contributions to Integrated Care
Nursing	Patient monitoring, care coordination, education	Facilitates continuity of care, bridges communication with patients, supports interdisciplinary collaboration
Pharmaceutical	Medication management, safety checks, patient education	Prevents adverse drug interactions, optimizes therapeutic outcomes, supports treatment adherence
Paramedic	Emergency response, stabilization, patient transport	Ensures rapid initial care, improves handoff processes, provides accurate pre-hospital patient data to other departments
Laboratory	Diagnostic testing, result interpretation	Enhances diagnostic accuracy, speeds up clinical decision-making, minimizes delays in treatment initiation

Below is a diagram illustrating how each department collaborates within an integrated care model to achieve efficient, patient-centered care.

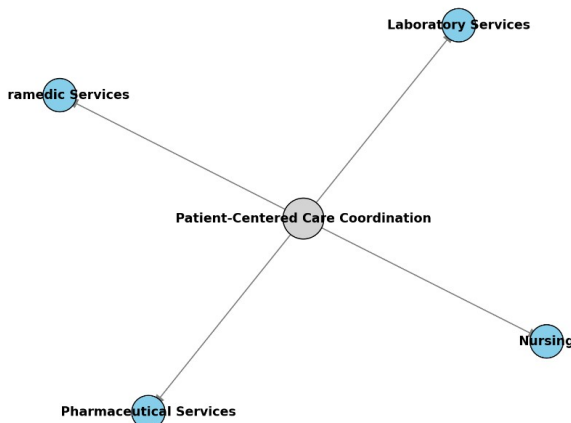


Figure. Integrated Care Model Showing Departmental Collaboration

In this model, communication channels represent the pathways through which departments share critical information. Regular interdisciplinary meetings, shared access to electronic health records (EHR), and collaborative decision-making processes facilitate seamless interaction among departments, ensuring that each patient receives timely and coordinated care. This alignment across nursing, pharmaceutical, paramedic, and laboratory services forms the foundation of integrated care, making it possible to provide comprehensive, continuous care that addresses both acute and chronic healthcare needs. Each department’s unique contributions and the collaborative management of these resources underscore the effectiveness of integrated care systems.

Collaborative Management Strategies: Collaborative management in healthcare is essential for achieving integrated care, particularly

across departments like nursing, pharmaceutical, paramedic, and laboratory services. Effective strategies focus on fostering workflows, and implementing quality improvement initiatives.

Here are key collaborative management strategies that enhance the integration of care.

Interdisciplinary Teams

- **Definition and Purpose:** Interdisciplinary teams bring together healthcare professionals from various departments to coordinate patient care. These teams enable members to share insights, leverage diverse expertise, and address patient needs holistically.
- **Implementation:** Regular team meetings, structured case discussions, and joint care planning sessions are common practices. These forums provide a platform for departments to discuss complex cases, update each other on patient status, and ensure all team members are aligned on treatment goals.
- **Benefits:** Improved patient outcomes, reduced redundancies, and a shared sense of responsibility among team members (Petri, 2010).

Communication and Information Sharing

- **Purpose:** Efficient communication is vital in integrated care to ensure timely sharing of information across departments, prevent errors, and maintain continuity of care.
- **Strategies:** Using shared electronic health records (EHRs), secure messaging systems, and real-time data-sharing platforms are effective ways to facilitate communication. Implementing standardized communication protocols, such as SBAR (Situation, Background, Assessment, Recommendation), ensures clarity in exchanges.
- **Benefits:** Enhanced accuracy in patient care, minimized delays in treatment, and improved collaboration between departments (Joint Commission, 2017).

Workflow Integration

- **Purpose:** Workflow integration focuses on aligning departmental workflows to reduce redundancies, improve patient flow, and avoid bottlenecks.
- **Strategies:** Cross-training staff to understand different departmental workflows, co-locating teams when feasible, and designing workflows that promote the sequential handoff of tasks can improve efficiency. Lean management techniques, such as value-stream mapping, help identify inefficiencies in care processes.
- **Benefits:** Reduced wait times, streamlined patient journeys, and higher satisfaction among healthcare providers and patients alike (Young et al., 2015).

Quality Improvement Initiatives

- **Definition:** Quality Improvement (QI) initiatives in healthcare aim to continuously enhance care processes to improve patient outcomes and operational efficiency.
- **Strategies:** QI initiatives may include developing performance metrics, such as patient satisfaction scores, readmission rates, and treatment times. Conducting regular audits and feedback sessions and involving all departments in QI projects fosters a culture of continuous improvement. Examples include projects targeting reduced medication errors or faster diagnostic test turnarounds.
- **Benefits:** Improved patient safety, measurable improvements in care quality, and heightened accountability among team members (Batalden & Davidoff, 2007).

Training and Professional Development

integrated care.

- **Strategies:** Interdepartmental training workshops, team-building exercises, and role-playing scenarios are valuable for developing collaboration skills. Continuous education on new protocols and technologies relevant to collaborative care (e.g., shared EHR use) is equally important.
- **Benefits:** Enhanced readiness to collaborate, greater adaptability, and a strong culture of teamwork among healthcare providers (Reeves et al., 2013).

Patient and Family Involvement

- **Purpose:** Engaging patients and their families in the care process enhances patient-centered care, improves compliance, and provides valuable feedback to healthcare teams.
- **Strategies:** Involving patients in decision-making, educating them on their treatment options, and ensuring transparency in care plans empower them to be active participants. Family conferences and decision-making meetings can also provide crucial support.
- **Benefits:** Higher patient satisfaction, improved adherence to treatment, and better health outcomes (Carman et al., 2013).

These collaborative management strategies provide a structured framework for integrating care across nursing, pharmaceutical, paramedic, and laboratory services. By implementing these strategies, healthcare organizations can break down silos, enhance communication, and deliver more effective, patient-centered care.

Impact of Integrated Care on Patient Outcomes: Integrated care models significantly impact patient outcomes by enhancing quality of care, reducing medical errors, improving patient satisfaction, and optimizing healthcare resource utilization. Through coordinated efforts among nursing, pharmaceutical, paramedic, and laboratory services, integrated care can lead to better clinical outcomes and higher operational efficiency.

Key Areas of Impact

Patient Satisfaction and Experience

- Integrated care models that foster communication and collaboration among departments improve the patient experience by providing seamless, patient-centered services. Patients report higher satisfaction when they feel all providers are aligned on their care, reducing confusion and creating a more supportive environment (Coulter et al., 2013).

Clinical Outcomes

- Studies indicate that integrated care models reduce mortality rates, especially in patients with chronic illnesses who benefit from coordinated management plans. Integrated care is also associated with lower rates of hospital-acquired infections, reduced complications, and faster recovery times (Wagner et al., 2001).

Operational Efficiency

- Integrated care reduces redundant testing and improves patient flow, leading to more efficient healthcare delivery. Reduced hospital stay durations and decreased wait times are commonly observed in integrated care models, optimizing resource allocation and cutting costs (Kodner & Spreuwenberg, 2002).

Cost-Effectiveness

management, and preventive care approaches (Bodenheimer et al., 2002).

Table 2. Impact of Integrated Care on Patient Outcomes

Outcome	Description	Examples
Patient Satisfaction	Higher patient contentment due to seamless, coordinated care	Patients experience fewer delays and consistent care messages
Improved Clinical Outcomes	Enhanced recovery, lower mortality, fewer complications	Reduced hospital-acquired infections, improved chronic disease management
Operational Efficiency	Faster service delivery, reduced duplication, and optimized workflows	Decreased wait times, shorter hospital stays
Cost Savings	Reduced readmissions and redundant testing, overall reduction in healthcare expenditure	Cost-effective medication management, minimized unnecessary diagnostics

Below is a chart summarizing the overall impact of integrated care on key patient outcomes, demonstrating positive effects across satisfaction, clinical outcomes, efficiency, and cost savings.

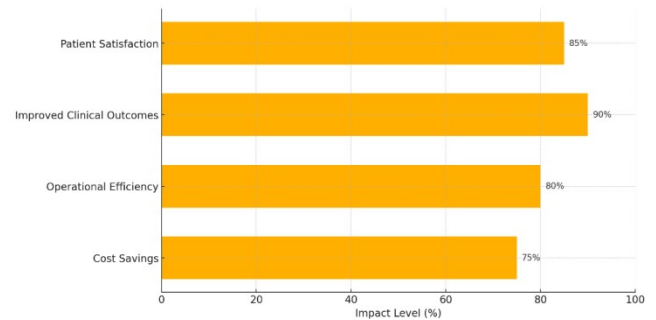


Figure 2. Integrated Care Impact on Key Patient Outcomes

The chart shows how integrated care positively affects patient satisfaction, clinical outcomes, operational efficiency, and cost savings, with high impact percentages across these areas. This visual representation highlights the significant improvements in healthcare quality and efficiency achieved through an integrated care approach.

Challenges and Barriers to Integration

While integrated care models offer substantial benefits, implementing them in healthcare settings often encounters numerous challenges and barriers. These obstacles can hinder the effectiveness of interdepartmental collaboration and prevent healthcare systems from fully realizing the potential of integrated care.

System-Level Barriers

- **Funding Constraints:** Adequate funding is essential for training, technology, and infrastructure to support integrated care. Limited resources often lead to budget cuts that disrupt integrated care programs, reducing their effectiveness (Goodwin et al., 2012).
- **Incompatible Information Systems:** Different departments may use separate electronic health record (EHR) systems that are not compatible with one another, preventing real-time information sharing. This lack of interoperability complicates care coordination and can result in fragmented care (Vest & Gamm, 2010).
- **Regulatory and Policy Barriers:** Healthcare regulations may restrict certain collaborative practices, especially when involving patient data sharing. Privacy laws such as HIPAA in

necessary information across departments (Knoppers, 2014).

Organizational and Cultural Barriers

- **Departmental Silos:** Healthcare departments often operate independently, resulting in “siloed” operations where each unit works in isolation. This creates barriers to collaboration, with departments less willing to share information or coordinate workflows (Ahgren& Axelsson, 2005).
- **Leadership and Accountability Issues:** In integrated care, shared responsibility among departments can lead to unclear leadership roles. Without strong leadership, departments may lack direction in collaborative efforts, weakening the coordination process (Valentijn et al., 2013).
- **Cultural Differences Among Healthcare Providers:** Each department has its own culture, professional language, and priorities, which can hinder effective communication and collaboration. Nurses, physicians, pharmacists, and other professionals may have differing views on care priorities, complicating consensus-building in patient care (Petri, 2010).

Communication and Workflow Challenges

- **Inefficient Communication Channels:** Without effective communication tools and protocols, messages can be delayed or misinterpreted, impacting care coordination. Miscommunication leads to errors in care delivery, duplicated efforts, and patient dissatisfaction (Joint Commission, 2017).
- **Complex Workflow Integration:** Each department has its own workflows, and integrating these can be challenging. Misaligned workflows lead to inefficiencies, such as bottlenecks, longer wait times, or redundant tasks, which hinder seamless care transitions (Young et al., 2015).

Human Resource Limitations

- **Staff Shortages:** Many healthcare settings face staffing shortages, which place extra burdens on existing staff and limit time for collaborative activities. Shortages, particularly in nursing and paramedics, can make it difficult to implement consistent integrated care practices (Bodenheimer & Smith, 2013).
- **Insufficient Training:** Effective integrated care requires professionals to be trained in interdepartmental collaboration, communication, and shared decision-making. Lack of training can reduce the quality of care provided, as staff may not fully understand their role within an integrated framework (Reeves et al., 2013).
- **5. Resistance to Change**
- **Reluctance to Adapt to New Models:** Professionals accustomed to traditional models of care may resist integrated approaches due to unfamiliarity or discomfort with new practices. Resistance to change can delay or prevent the implementation of integrated care models (Schein, 2010).
- **Perceived Loss of Professional Autonomy:** In collaborative environments, some professionals may feel that their autonomy is reduced, particularly when they are required to coordinate with other departments. This can lead to decreased motivation and engagement in collaborative efforts (Ahgren& Axelsson, 2005).

Addressing these barriers requires a concerted effort from healthcare leadership, policymakers, and care providers. Strategies to mitigate these challenges include allocating sufficient resources, investing in interoperable EHR systems, promoting strong leadership for

culture that values teamwork and interdepartmental collaboration.

With the right policies and infrastructure in place, healthcare organizations can overcome these obstacles and realize the full potential of integrated care.

CONCLUSION

Integrated care models represent a transformative approach to healthcare delivery, prioritizing collaboration among departments such as nursing, pharmaceutical, paramedic, and laboratory services. By promoting interdisciplinary teamwork, effective communication, and aligned workflows, integrated care systems aim to provide comprehensive, patient-centered care that enhances clinical outcomes, improves patient satisfaction, and optimizes operational efficiency. This review underscores the significant benefits of integrated care but also highlights the challenges and barriers that healthcare systems face when attempting to implement these models. System-level constraints, organizational silos, communication hurdles, and cultural differences among departments pose obstacles that can hinder effective integration. Addressing these barriers requires a concerted effort from healthcare leaders, policymakers, and professionals, who must invest in interoperable technology, promote supportive policies, and foster a culture of teamwork and continuous improvement. Ultimately, overcoming these challenges is essential for building resilient, sustainable healthcare systems that can meet the complex needs of modern patient populations. By embracing integrated care and addressing the structural and cultural barriers to its implementation, healthcare organizations can improve the quality, accessibility, and efficiency of care. The findings of this review underscore the importance of integrated care as a foundation for delivering high-quality healthcare and support continued research, policy development, and innovation in this field.

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