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Literature Review: The Impact of Artificial Intelligence on Administrative Workflow Efficiency in Hospitals

As artificial intelligence becomes increasingly integrated into healthcare, much of the public's attention has focused on its potential in clinical decision-making. However, one of AI's more immediate applications in hospitals may be improving administrative workflow.

Administrative responsibilities, such as between-unit care coordination and scheduling, consume a significant portion of a healthcare professional's workday, limiting the time available for direct patient care. Simultaneously, healthcare systems continue to face increasing patient demand, driven by an aging population and persistent workforce shortages, making administrative efficiency essential to maintaining quality care. In response, healthcare administrators have already begun integrating AI into hospital operations, with nearly one-fifth of U.S. hospitals adopting some form of artificial intelligence by 2022 (Bin Abdul Baten, 2024).

The purpose of this literature review is to synthesize and analyze existing evidence on AI integration in hospital administrative workflows, highlighting major trends and bringing remaining gaps in research to light. Specifically, this review examines the common themes of administrative workflow efficiency, care coordination and patient transportation, and the benefits of integration, while critically evaluating the implementation challenges associated with AI integration.

Methods

The research included in this review was primarily sourced using Northeastern ScholarOne Search and the PubMed databases. Searches were limited to peer-reviewed journal articles published from 2022 onwards. Search terms included ‘AI workflow hospital’, ‘artificial intelligence administrative workflow’, ‘hospital workflow optimization’, and ‘AI hospital scheduling’. The Web of Science (Clarivate) was also utilized, limiting the results to the Medical Informatics category and sorting journals by descending impact factor to produce the highest-impact publications at the top of the search.

Studies were included if they evaluated the impact of AI technologies on administrative processes. Articles focusing solely on clinical diagnosis and treatment were excluded unless they also evaluated workflow outcomes. Both quantitative and qualitative studies were considered for the analysis to provide a comprehensive synthesis of the operational benefits of AI integration and allow for a critique of the limitations associated with its integration into hospital administrative workflows. After screening for relevance, eight peer-reviewed articles were selected and identified for recurring themes that included administrative workflow efficiency, care coordination and patient transportation, and implementation challenges.

Overview of Findings

ScholarOne Search, an academic research database, together with PubMed and Web of Science, yielded eight bodies of research published between 2022 and 2026. Much of the literature consists of quantitative observational, retrospective, and system implementation studies, while a handful of sources are narrative and qualitative reviews that reflect existing evidence. Although most studies reported measurable improvements in workflow performance, few evaluated the long-term outcomes and influence over multiple hospital systems, limiting generalizability. The following analysis will synthesize the literature for a thematic comparison

of artificial intelligence applications in hospital administrative workflows, while also identifying gaps within current literature, conflicting findings, and implementation barriers.

Administrative Workflow Efficiency

Across multiple healthcare institutions, researchers have consistently found that artificial intelligence reduces administrative burden by automating routine tasks and streamlining hospital workflows. Yelne et al. (2023) describe AI as a transformative technology that improves healthcare operations by supporting resource allocation, optimizing staff scheduling, and forecasting patient admission rates. Similarly, Griewing et al. (2022) emphasize that operational improvements depend on integrating AI into standardized digital workflows that reduce routine documentation and support communication across departments. To add, Rosa et al. (2023) identify time constraints, error avoidance, and workflow optimization as the primary motivators behind AI development in healthcare, finding that AI can, for example, reduce the time clinicians spend reviewing medical images by as much as 20%. This AI-assisted clinical oversight allows clinicians to redirect time previously dedicated image reviewing to specialized, direct care and patient-centered tasks.

Research also suggests that AI improves hospital operations by strengthening workflow management during periods of high demand. AI can “prioritize positive cases, especially in increasing workload scenarios (ED, night shifts)” (Rosa, et al., 2023). This is especially important in aiding in patient prioritization, identifying patients who must be attended to more urgently. Yelne et al. (2023) explains that predictive AI analytics can forecast patient admission rates, allowing hospitals to respond proactively by adjusting staffing levels and resource allocation.

Care Coordination and Patient Transport

In addition to improving administrative tasks, the researchers have found that AI improves coordination between hospital departments by reducing workflow bottlenecks and promoting communication. Haykal (2026) argues that AI is most effective when it strengthens interconnected workflows rather than simply automating isolated administrative tasks. These findings are supported by Doheim et al. (2026), who conducted a multicenter retrospective observational study using a prospectively maintained database to compare hospital workflow metrics before and after implementation of an AI-enabled stroke triage platform across four comprehensive stroke hub centers. AI-enabled hospitals experienced significantly shorter patient transfer times than hospitals without AI-supported triage, reducing delays by approximately 42 minutes (Doheim et al., 2026). AI integration also shortened treatment initiation times, suggesting that more efficient coordination allowed patients to receive direct care more urgently.

The benefits of improved coordination extended beyond patient transport alone. AI-supported stroke triage generated approximately \$3.6 million in cost savings for every 1,000 patient transfers, indicating that a streamlined workflow can substantially reduce healthcare expenditures (Doheim et al., 2026). However, Haykal (2026) also cautions that “time saved does not automatically translate to improved care unless it is reinvested in meaningful clinical interactions or enhanced diagnostic pathways”. This perspective suggests that what healthcare professionals do with the time saved is equally important. While AI can create opportunities for greater efficiency, hospitals must simultaneously improve areas of care not dictated by AI, like quality of care and strengthening clinical decision-making.

Collectively, although literature consistently reports measurable reductions, researchers also emphasize that the greatest benefits occur when AI is accompanied by effective

organizational strategies. These findings suggest that successful AI implementation requires hospitals to view the system as an enhancement for improving overall quality and continuity of patient care rather than the ultimate objective itself.

Benefits of Integration

Researchers repeatedly concluded that AI should function as a collaborative tool that supports healthcare professionals rather than replacing them. According to Yelne et al. (2023), AI offers hospitals the opportunity to address growing patient volumes and resource constraints by improving operational efficiency across diverse administrative functions. These findings are supported by Abdul Baten et al. (2024), whose national survey demonstrated increasing hospital AI adoption as organizations seek solutions to growing clinical demands. Coupled, these studies suggest that institutions are increasingly recognizing AI as an effective operational tool in a setting where workforce capacity is limited.

Researchers also agree that AI integration does not translate to full automation of medical decision-making, but rather to provide support to clinicians. Haykal (2026), Zhou et al. (2026), and Rosa et al. (2023) each emphasize that AI should function as a decision-support tool rather than replacing physician oversight. For example, Rosa et al. (2023) found that AI can reduce the time spent on repetitive image interpretation and help prioritize urgent cases during periods of high clinical demand. Similarly, Zhou et al. (2026) determined that physicians were most supportive of AI integration in administrative workflow applications, like documentation and scheduling, rather than making clinical decisions. Participants in Zhou's study frequently referred to AI as a "back-office tool", perceiving the functions as more administrative rather than patient-facing (Zhou et al. 2026). Overall, the literature suggests that AI has not yet advanced to a stage when independent clinical decision-making is completely reliable. This distinction is

recurring and reflects the growing consensus that AI's primary contribution currently lies in reducing administrative burden instead of replacing healthcare professionals.

These studies further support the argument that AI creates the greatest value when it supplements, rather than replaces, healthcare professionals. Although AI has demonstrated performance comparable to clinicians in some administrative tasks, the current literature does not support claims that it consistently outperforms human ability. For example, Rosa et al. (2023) found that AI-assisted image review achieved non-inferior performance compared with experienced radiologists, reinforcing its position as a tool rather than replacing physician oversight. The authors also note that “diagnostic delays caused by interpretive errors may lead to delayed treatments, increased surgical risks, and poor outcomes”, with recent studies showing that 75% of patient complaints stem from interpretative mistakes and incorrect diagnoses (Rosa et al., 2023). This finding underscores the benefit of AI serving as a critical reader, helping clinicians identify subtle abnormalities that may have been overlooked upon initial review. Similarly, Haykal (2026) explains that AI systems designed around pre-existing clinician workflows reduce cognitive burden with their ability to “anticipate clinician needs, automate repetitive tasks, and surface insights at the moment of decision”. As Rosa et al. (2023) “time constraints, error avoidance, and workflow optimization are the most significant drivers for the development of AI as a tool in healthcare”. Understood together, these findings indicate that surpassing clinicians in medical decision-making or role in patient care is not the goal, rather, the evidence suggests that relieving administrative burden is the principal purpose.

Limitations

Despite consistent quantitative and qualitative evidence that AI improves hospital workflow efficiency, researchers agree that successful implementation is not merely adoption.

Instead, the literature brings attention to organizational preparedness as a critical role in determining whether AI can be effectively integrated. Haykal (2026) adds that hospitals must invest in leadership support, staff training, workflow redesign, and continuous evaluation before sustainable improvements can be achieved. “Hospitals must therefore develop evaluation frameworks that assess clinical outcomes, patient experience, safety, workflow resilience, and workforce well-being, not only financial return” (Haykal, 2026).

Researchers also identify healthcare provider acceptance as one of the greatest barriers to widespread adoption. Zhou et al. (2026) concluded that physicians generally supported AI to reduce administrative workload, but many expressed hesitations toward clinical decision-making systems. One participant noted that “the single most important factor in the success or failure of a new technology... may be whether the staff who use it accept it” (Zhou et al., 2026). Rosa et al. (2023) also reported that some clinicians remained skeptical of AI because its recommendations often functioned as a “black box”, with no explanation of how conclusions were generated. This information suggests that physician trust depends on observable outcomes and the establishment of reliability.

Financial and technology accessibility barriers are also prevailing across healthcare systems. Zhou et al. (2026) found that limited institutional funding was often preventing hospitals from adopting AI technologies, with one physician stating, “AI is just too expensive... our hospital doesn’t give any budget for this at all.”

Several limitations within the current body of research can be identified, making these findings difficult to apply broadly. As previously discussed in the Overview of Findings, many implementation studies, including works by Doheim et al. (2026) and Rosa et al. (2026), were conducted within individual hospitals or specific departments. While these studies consistently

report quantitative data regarding transfer times and operational costs, these findings may not generalize to institutions with different staffing structures, existing workflows, and resources. Additionally, few studies evaluated long-term outcomes of AI implementation, making it difficult to determine if workflow improvements are sustained over time.

Conclusion:

AI has become increasingly integrated in every sector of society, and current research suggests that its benefits extend widely to hospital operational workflows. Evidence shows that AI can improve scheduling, care and hospital network coordination, patient transportation and resource allocation while simultaneously reducing healthcare worker burnout. Although financial, implementation, and institutional readiness issues exist, these limitations stand small next to the potential benefits of hospital workflow AI integration. Much of the current research is focused on short-term outcomes within individual healthcare systems and hospitals, displaying a gap in research for long-term organizational outcomes across diverse clinical settings. With research across observational trials and interviews with clinicians for qualitative assessment, the current literature supports the integration of artificial intelligence to improve workflow efficiency, reduce burnout, and strengthen communication. AI integration continues to enhance the quality of patient care as healthcare systems are challenged to meet the demands of a rapidly growing and aging population.

AI Disclosure Statement:

I utilized AI to refine grammar and improve my organization. The content, analysis, and final written work are my own.

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