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Optimizing Urgent Care Workflow to Improve Wait Times for Patients

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Walden University

College of Management and Human Potential

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Keanna Evans

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Optimizing Urgent Care Workflow to Improve Wait Times for Patients

by

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Abstract

Leaders in urgent care centers across the United States continue to face challenges with patient flow, long wait times, and inconsistent staffing. The purpose of this integrative review was to explore strategies that help improve workflow efficiency and reduce wait times in urgent care settings. The review question pertained to strategies and best practices that could be implemented to improve patient flow management in urgent care centers. This study was guided by general systems theory, which views urgent care as a connected system where people, processes, and technology work together to influence outcomes. A review of literature published within the past 5 years produced 96 relevant studies, and 28 of those were analyzed using the Johns Hopkins evidence-based practice model. From this analysis, five main themes and 12 subthemes emerged. The five themes included (a) process improvement, (b) workflow optimization, (c) technology integration, (d) staff engagement and development, and (e) patient-centered communication. Subthemes focused on workflow standardization, triage protocols, predictive scheduling, real-time monitoring, leadership, morale, and patient feedback. The findings showed that improving coordination and communication between all parts of the workflow helps increase efficiency, reduce delays, and improve the overall patient experience. Applying systems theory to urgent care settings supports sustainable improvement and helps create a stronger, more efficient, and patient-focused environment that promotes positive social change.

Part 1: Practice-Based Problem

Problem of Interest

Long wait times in urgent care centers have become a growing concern, affecting patient satisfaction and the overall quality and efficiency of care delivery. Urgent care centers serve as critical access points for patients seeking immediate medical attention for non-life-threatening conditions (Taylor & McDermott, 2018). However, many face extended wait times, leading to frustration, decreased healthcare system trust, and potential health outcomes. This review was essential because despite the increasing dependence on urgent care services there is a scarcity of comprehensive research identifying the primary factors contributing to extended wait times or assessing the efficacy of interventions designed to mitigate them (see Harris et al., 2021). A comprehensive synthesis of current findings can help bridge this gap and provide healthcare providers and administrators with valuable insights for operational improvements. The implications for positive social change are significant. Urgent care centers can improve patient experiences, increase access to timely care, and alleviate pressure on emergency departments by reducing wait times (Harris et al., 2021). Ultimately, these improvements contribute to a more efficient, equitable, and patient-centered healthcare system.

Healthcare Administration Problem

Background

Urgent care centers emerged in the United States in the 1970s as a response to overcrowded emergency departments (EDs) and the need for more convenient, cost-effective access to nonemergency medical care (Harris et al., 2021). Their goal was to fill

the gap between primary care and emergency services by offering extended hours and walk-in appointments for illnesses or injuries that are not life-threatening but still require prompt attention (Hren et al., 2022). As the demand for immediate care grew, especially in the 2000s, urgent care centers proliferated and by 2024, there were over 11,000 centers nationwide (Montazeri et al., 2021). This rapid growth, while helpful in expanding access, has introduced several administrative challenges. Chief among them is managing patient flow efficiently, especially during peak hours (Hren et al., 2022). Many urgent care centers face operational bottlenecks due to inconsistent staffing, limited space, lack of real-time scheduling systems, and variability in patient acuity levels (Montazeri et al., 2021). Additionally, urgent care centers often struggle with aligning expectations because patients may anticipate emergency-level speed and care while the center operates more like a primary care facility (Hren et al., 2022). These mismatches can lead to dissatisfaction, overcrowding, and overworked staff, all contributing to prolonged wait times and inefficient patient throughput.

Operational Problem

A growing body of evidence has highlighted prolonged wait times and inefficient patient flow as persistent and significant issues in urgent care centers, with profound implications for patient satisfaction and overall healthcare delivery. Harris et al. (2021) emphasized that extended wait times are among the most common sources of patient dissatisfaction in urgent care environments. Their study demonstrated that patients' perceptions of care quality are strongly influenced by how quickly they are seen, regardless of clinical outcomes. This underscores a key administrative challenge: even high-quality medical services can be perceived negatively if operational inefficiencies

exist. Building on this, Montazeri et al. (2021) addressed the current relevance of this problem by investigating how digital tools can be used to improve patient flow. Their simulation study found that using technology to collect patients' symptoms and medical histories before consultation significantly reduced wait times and enhanced the triage process. This finding supports the need for innovation in urgent care workflows and reflects the broader shift toward digital health solutions in healthcare administration.

Hren et al. (2022) further validated the problem's importance through a study conducted across multiple outpatient care settings. They concluded that long wait times adversely affect patients' satisfaction and trust in healthcare providers, making it clear that timely service is critical to quality care. Taken together, these studies illustrated that inefficient patient flow is not just a logistical concern but a systemic issue with far-reaching impacts on patient experience, care outcomes, and the reputation of healthcare organizations (Harris et al., 2021). Addressing this challenge is essential for urgent care centers seeking to meet rising patient expectations and deliver responsive, high-value care.

Ideal State of Operations

The ideal and desired state of operations for urgent care centers revolves around creating an efficient, streamlined environment that minimizes wait times, optimizes patient flow, and ensures high patient satisfaction. Achieving this state requires a comprehensive approach integrating process improvements, staff training, and technological innovations to manage patient expectations and enhance operational efficiency (Taylor & McDermott, 2018). One model that has shown success in improving patient flow is the implementation of lean six sigma methodologies, which emphasized

eliminating waste, reducing inefficiencies, and improving overall process reliability.

Smith and Brown (2019) detailed how urgent care centers can apply Lean Six Sigma to identify bottlenecks in patient flow and reduce unnecessary delays. This method focused on the entire care process -- from patient arrival and registration to treatment and discharge -- by standardizing procedures, reducing variations, and optimizing staff allocation. By doing so, urgent care centers can achieve faster response times, more effective resource utilization, and enhanced patient satisfaction. According to Smith and Brown, the desired state includes smoother transitions through each stage of care, enabling more patients to be seen in a shorter amount of time without compromising care quality.

In addition to operational efficiencies, managing patient expectations is crucial to achieving an ideal patient experience. Simmons et al. (2022) highlighted the importance of communication in reducing perceived wait times and improving patient satisfaction. Their research showed that patients are more likely to feel satisfied despite extended waiting periods when informed about expected wait times and the reasons for delays. An ideal system would include proactive communication strategies, such as real-time updates on wait times, explanations of delays, and reassurance that patients will be seen promptly (Simmons et al., 2023). This approach helps align patient expectations with the realities of the urgent care setting, making the overall experience feel more predictable and less frustrating.

Moreover, digital tools, such as patient intake software and appointment scheduling systems, can further enhance the desired state of operations (Johnson & Richards, 2021). These technologies can streamline the intake process, reduce

administrative time, and help better manage patient flow (Johnson & Richards, 2021). By integrating digital solutions with traditional care models, urgent care centers can achieve a more responsive and efficient environment where patients are triaged accurately and quickly, and staff can focus on providing high-quality care.

Therefore, the ideal state of operations for urgent care centers is one where wait times are minimized, patient flow is optimized, and patient expectations are managed effectively. Achieving this requires a multifaceted approach that combines process improvement methodologies like lean six sigma, real-time communication strategies, and the integration of digital tools (Bonney & Atkinson, 2020). When all these elements work in harmony, urgent care centers can deliver timely, high-quality care while maintaining high levels of patient satisfaction.

Professional Practice Gap Statement

Many urgent care centers are challenged by inefficient patient flow and outdated scheduling systems, resulting in prolonged urgent care centers wait times that average 45 minutes and can extend up to 120 minutes (Harris et al., 2021). These delays hinder timely care access, negatively impacting patient satisfaction and straining operational resources (Ayers, 2024; Smith & Jones, 2022). Research has consistently highlighted that such inefficiencies stem from a failure to align administrative processes with the increasing demand for urgent care services.

Ideally, urgent care centers should strive toward a state where patient flow is streamlined and scheduling systems are optimized to manage demand and capacity proactively. By implementing evidence-based strategies, organizations have the potential to reduce wait times by 30–50%, which can, in turn, enhance patient satisfaction scores

by 20–30% and boost operational efficiency by as much as 25% (Kruse et al., 2019).

Achieving this professional practice standard would better align urgent care centers with high-performing, patient-centered care principles and support more sustainable, value-driven healthcare delivery.

Summary of Evidence

Urgent care centers have become vital to the healthcare delivery system, offering timely access to care for non-emergent conditions. However, as demand for urgent care services continues to rise, many centers struggle with prolonged patient wait times and inefficient patient flow processes, which are administrative issues that directly impact the quality of care delivery and organizational performance (Smith & Jones, 2022).

Inefficient patient throughput has been identified as a widespread industry issue. On average, patients wait 45 minutes to be seen in urgent care centers, with peak times pushing delays to over 2 hours (Ayers, 2024). These delays are not solely a clinical issue; they represent a breakdown in administrative operations, including scheduling, triage prioritization, staffing optimization, and communication workflows (Johnson et al., 2023).

According to Ayers (2024), ineffective scheduling systems and a lack of dynamic resource allocation contributed significantly to congestion and prolonged wait times. When administrative systems fail to adapt in real-time to patient volumes, bottlenecks form, resulting in reduced staff morale, increased burnout, and lower patient satisfaction. Patients often perceive long wait times as a reflection of poor care quality, even if clinical outcomes remain unaffected (Martin & Lopez, 2021).

Further, the literature has suggested that targeted interventions such as Lean process improvement, real-time data dashboards, predictive scheduling models, and electronic check-in systems may substantially improve urgent care efficiency. The implementation of patient flow optimization strategies in urgent care settings has been shown to positively influence operational performance. Centers that enhance their intake, triage, and throughput processes can achieve measurable gains in efficiency and patient satisfaction. These improvements reflect a more coordinated and patient-centered approach to care delivery. Nevertheless, despite growing evidence supporting these workflow enhancements, many urgent care centers have been slow to integrate them into routine practice, limiting their ability to fully address delays and service bottlenecks. This gap between proven solutions and real-world adoption highlights the ongoing need for structured administrative strategies that address the complexity of patient flow within urgent care environments.

Purpose of the Integrative Review

This integrative review aimed to evaluate and synthesize evidence-based strategies to optimize patient flow, reduce wait times, and improve staffing efficiency in urgent care centers. This review addressed the healthcare administration problem of operational inefficiencies contributing to prolonged patient waiting times, suboptimal care coordination, and increased patient dissatisfaction. By focusing on key administrative interventions such as streamlined scheduling, dynamic staffing models, and workflow redesign, the review sought to identify practical, scalable solutions that healthcare administrators can implement to enhance operational effectiveness, improve patient satisfaction, and ultimately elevate care quality. The operational delays and inefficiencies

in urgent care centers affect patient satisfaction and disproportionately impact vulnerable populations, particularly those with limited access to primary care, inadequate transportation options, and constraints on their time due to employment or socioeconomic factors (Lee et al., 2020). These delays exacerbate health disparities, particularly in underserved communities, by limiting timely access to care and worsening health outcomes. These issues are directly related to social determinants of health, such as economic stability, access to healthcare, and social support systems, which can significantly impact a patient's ability to receive the care they need. As such, this integrative review also explored how addressing patient flow and reducing inefficiencies in urgent care settings can improve health equity by ensuring more equitable access to timely care (see Smith et al., 2023).

Integrative Review Question

The review question was as follows: What strategies and best practices could be implemented to improve patient flow management in urgent care centers? This question sought to identify and evaluate effective solutions to systemic inefficiencies in urgent care delivery. The primary objective is to enhance patient experience by reducing wait times and improving overall care flow. Key strategies under consideration included the implementation of evidence-based triage systems that prioritize patients according to the severity of their condition, along with the use of technology-driven solutions such as patient tracking systems and real-time operational dashboards. These tools enable dynamic adjustments to staffing and resource allocation in response to patient demand. Furthermore, the development of fast-track pathways for patients with non-urgent needs has been shown to reduce delays and improve throughput. Best practices such as digital

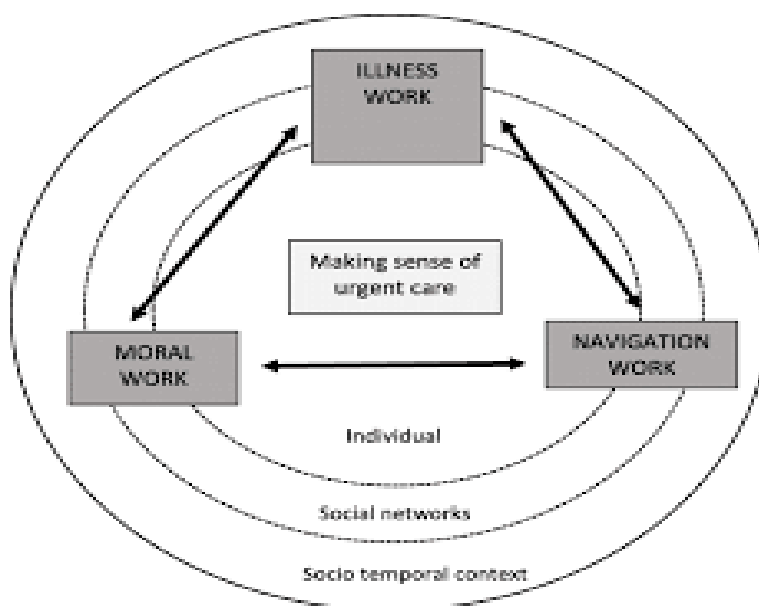
preregistration and virtual consultations can also alleviate congestion in waiting areas, streamline patient intake processes, and reduce the administrative burden on in-center staff (Curry & Reed, 2022).

Theoretical and/or Conceptual Framework

Efficient patient flow management is essential in urgent care centers, as delays can significantly increase wait times, decrease patient satisfaction, and compromise care quality and systems theory offers a robust framework for addressing these challenges. Systems theory, developed by Ludwig von Bertalanffy, suggests that organizations are complex systems where each component is interconnected, with changes or inefficiencies in one part affecting the entire system (Von Bertalanffy, 1972). In urgent care centers, these components include patient intake, triage, staffing, treatment, and resource management. For instance, if delays in triage occur, they affect subsequent stages, causing longer wait times for patients and reducing the overall quality of care. By applying systems theory, administrators are encouraged to view the center as a whole, understanding that improving one area, such as staffing or resource allocation, requires considering its effects on the entire system (Curry & Reed, 2022). This holistic approach facilitates optimizing patient flow through coordinated improvements across various operational components. A diagram illustrating systems theory (see Figure 1) shows a flowchart of the urgent care center, emphasizing the interconnections between intake, triage, treatment, staffing, and resources and demonstrating how inefficiencies in one process can ripple through the system.

Figure 1

Diagram Illustrating Connections Between Systems Theory and Urgent Care Wait Times



Systems theory provides a comprehensive framework for improving patient flow in urgent care centers. Systems theory focuses on understanding the interconnectedness of various elements within the center and offers specific tools and techniques for eliminating waste and optimizing workflows by identifying and addressing inefficiencies. For instance, improving triage procedures, aligning staffing with patient demand, and ensuring that resources are used efficiently are all strategies that can help reduce wait times and improve care delivery. Systems theory provides an integrated approach that helps organizations realize ways to enhance efficiencies of each step in the patient flow process, from intake to discharge.

Part 2: Literature Review, Quality Appraisal, and Analysis

Literature Search Strategy

As a healthcare professional who has experienced firsthand the consequences of long wait times in urgent care, I recognize how vital efficient workflow is to delivering timely, high-quality care. Patients often come to urgent care centers expecting quick relief, only to face delays that contribute to frustration, reduced satisfaction, and, in some cases, compromised outcomes. These inefficiencies are not typically due to a lack of clinical expertise; they more often result from breakdowns in operational flow. This doctoral project aimed to identify and apply evidence-based workflow optimization strategies, using systems theory as a guiding framework, to reduce patient wait times in urgent care. By viewing the urgent care setting as an interconnected system, this project examines how improvements to individual components of the workflow can positively affect the entire operation and lead to more streamlined, patient-centered care.

Literature Review Strategy

A thorough review of peer-reviewed literature published from 2020 to 2025 was conducted to ensure this study was informed by the most current research. Databases searched included PubMed, Google Scholar, ScienceDirect, and CINAHL. Relevant search terms included *urgent care*, *patient flow*, *wait times*, *workflow optimization*, and *scheduling*, with Boolean operators applied to enhance the precision of results.

Additionally, I reviewed modeling studies available on arXiv and incorporated grey literature and industry perspectives from sources such as Urgent Supply and other relevant healthcare industry reports. This approach provided a balanced view of evidence-based findings and practical, real-world applications.

Inclusion and Exclusion Criteria

To ensure the relevance and quality of the literature, specific inclusion and exclusion criteria were applied (see Table 1). Studies had to be peer-reviewed, published in English, and accessible in full text. Only articles focused on urgent care environments with themes related to workflow optimization, patient flow, wait time reduction, or scheduling were included. I considered quantitative and qualitative empirical studies, including systematic reviews, to provide a balanced foundation of evidence.

I excluded articles unrelated to urgent care -- such as those focused solely on emergency departments or inpatient care -- and older studies published before 2020. Nonempirical articles like opinion pieces and editorials were also excluded, along with studies that lacked methodological clarity or data transparency. Applying these criteria ensured that the studies reviewed were both relevant and credible.

Table 1

Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
Peer-reviewed articles	Non-peer-reviewed articles
Published between 2020-2025	Published before 2020
Focused on urgent care settings	Studies not related to urgent care
Topics included workflow optimization, patient flow, wait times, or scheduling	Topics unrelated to workflow or wait times
Full-text availability in English	Articles not available in English or full-text
Empirical research	Articles lacking supporting data

Search Strategy

Importantly, keywords and filters were applied to locate relevant studies using the above databases. From this initial search, approximately 100 articles were selected for deeper review. I organized and screened them against the inclusion and exclusion criteria, ultimately narrowing the pool to the most relevant and high-quality studies. Appendix B provides a complete list of the databases, search terms, and search results.

Quality Appraisal Process

Thirty articles were chosen to be evaluated in depth using the John Hopkins review form and they were categorized based on the strength of their methodology and evidence. About 12 studies were considered high quality (Level III), including intervention-based and quality improvement research. Fifteen articles were rated moderate quality (Level IV–V), often observational or case-based. A few lower-quality studies ($n = 3$) were included for practical insight, though they lacked rigorous data or used small sample sizes. While five articles were more descriptive or theoretical, most ($n = 25$) included empirical data directly addressing urgent care workflows, patient flow metrics, or wait time outcomes. This research and real-world context support a well-rounded understanding of workflow optimization strategies.

Thematic Analysis of Literature

After synthesizing the literature, several core themes emerged from the researchers. A leading theme was process improvement, with many studies highlighting the effectiveness of lean six sigma and similar methodologies in reducing inefficiencies (Alotaibi et al., 2022; Bonney & Atkinson, 2020). Another central theme in the research literature was staff engagement and training and studies by Alotaibi et al. (2022) and

Schwartz & Miller (2021) emphasized the importance of staff buy-in and comprehensive training programs to ensure the sustainability of workflow changes. Workforce management was also central and research by Davis and Fisher (2022), Ellis and Taylor (2022), and Johnson and Adams (2024) focused on predictive staffing, dynamic scheduling, and role optimization to minimize bottlenecks.

Technology integration emerged as a powerful but complex tool and authors such as Brown and Chen (2023), Carter and Walker (2021), and Fletcher and Patel (2023) discussed digital solutions like real-time dashboards and telemedicine, while others (Alexander & Brown, 2020; Kim, Y. L. & Park, D., 2020) noted adoption challenges. Patient-centered communication and scheduling were frequently discussed, with Jackson and Rivera (2023) and Morgan and Wilson (2023) addressing how transparency and flexibility influence patient satisfaction and workflow. These themes underscore the need for a layered, systems-based approach to urgent care optimization. All preliminary themes are shown in Table 2 and articles and themes are listed in Appendix D.

Table 2*Initial Listing of all Potential Themes and Subthemes*

Preliminary themes	Preliminary subthemes
Process improvement	Lean six sigma Workflow streamlining Waste reduction
Staff engagement & training	Staff buy-in Training Leadership support
Workforce management	Scheduling Shift planning Dynamic staffing
Technology integration	Real-time monitoring Telehealth Digital tools
Patient-centered communication	Flexible scheduling Feedback Wait time transparency
Teamwork & coordination	Role clarity Collaborative planning
Data-driven decision making	Dashboards Continuous quality improvement

Final Themes and Subthemes

The final themes (see Table 3) chosen for this study reflected more focused insights from the most robust studies. For example, systems theory approaches to process improvement (Alotaibi et al., 2022; Bonney & Atkinson, 2020) consistently demonstrated how workflow redesign could decrease delays. Workforce optimization emphasized aligning staffing with demand, improving nurse-to-patient ratios, and dynamic shift planning (Davis & Fisher, 2022; Ellis & Taylor, 2022). In technology integration, studies

have showcased how predictive tools and dashboards can enhance operational visibility, though challenges around training and adoption remain (Brown & Chen, 2023; Kim, Y.L. & Park, D., 2020). Staff engagement and development remained essential for successful implementation, with leadership support, training programs, and morale contributing to sustained improvements (Schwartz & Miller, 2021). Finally, patient-centered communication and scheduling reinforced that transparency and flexibility in communication help manage expectations and improve satisfaction (Jackson & Rivera, 2023; Morgan & Wilson, 2023).

Table 3

Final Five Themes and 13 Subthemes for Integrative Review Analysis

Theme	Subtheme
Process improvement	Workflow standardization Triage protocols
Workflow optimization	Staff allocation Predictive scheduling Shift planning
Technology integration	Real-time monitoring User training
Staff engagement & development	Staff training Leadership Morale
Patient-centered communication	Transparent messaging Flexible scheduling Patient feedback

Conclusion

The literature revealed that reducing patient wait times and improving workflow in urgent care is not a single-solution issue. A multipronged approach -- focused on process redesign, workforce optimization, and strategic use of technology, staff development, and patient-centered communication -- is essential. Each component is interrelated and reinforces the others. As I progress with this study, systems theory will serve as the framework to integrate these components, providing a comprehensive model to guide workflow improvements and support higher quality care in urgent care settings.

Part 3: Presentation of Results

Based on the findings, systems theory provides a valuable lens for understanding the interconnected nature of urgent care operations. Each identified theme -- process improvement, workflow optimization, technology integration, staff engagement, and patient-centered communication -- represents a subsystem that contributes to the overall functioning of the urgent care system. When one area, such as workflow standardization or staff allocation, is strengthened, it has a positive impact on other areas, including efficiency and patient satisfaction, reflecting the interdependence that systems theory emphasizes (Alotaibi et al., 2022). Conversely, weaknesses in areas such as leadership, morale, or communication can create bottlenecks that ripple throughout the entire system, leading to inefficiencies and increased wait times. By recognizing these interrelationships, systems theory highlights the importance of coordinated improvements, where changes in protocols, scheduling, training, or patient communication are not viewed in isolation but as part of a dynamic, adaptive system working toward reducing wait times and improving patient outcomes (Morgan & Wilson, 2023).

Thematic Map and Framework

The thematic map illustrates how the five major themes interconnect to form a cohesive framework for urgent care efficiency. Each theme represents a critical component of the system, with subthemes such as workflow standardization, triage protocols, predictive scheduling, real-time monitoring, leadership morale, and patient feedback serving as operational strategies that drive improvements. The framework highlights that no theme operates in isolation; instead, improvements in one area, such as

technology integration, can enhance workflow optimization and patient communication. Similarly, strong staff engagement supports effective process improvement, creating a synergistic effect across the system. This thematic framework, guided by systems theory, underscores the interdependence of organizational processes and demonstrates that sustainable reductions in wait times and improved patient outcomes rely on coordinated strategies rather than isolated interventions (Alotaibi et al., 2022; Morgan & Wilson, 2023).

Explanation of Themes and Subthemes

Process improvement: Process improvement focuses on refining urgent care processes to eliminate inefficiencies and enhance patient outcomes (Alotaibi et al., 2022).

- **Workflow standardization:** Workflow standardization establishes uniform steps and guidelines, ensuring care is consistent and predictable (Watson & Garcia, 2020).
- **Triage protocols:** Triage protocols organize patients by urgency, ensuring that the sickest patients are treated first for safety and efficiency (Lee et al., 2020).

Workflow optimization: Workflow optimization streamlines the movement of patients and staff to reduce delays and improve care delivery (Ellis & Taylor, 2022).

- **Staff allocation:** Staff allocation assigns employees to roles and tasks where their skills are most effective (Davis & Fisher, 2022).
- **Predictive scheduling:** Predictive scheduling uses data and patterns to forecast demand and prepare staffing in advance (Brown & Chen, 2023).
- **Shift planning:** Shift planning structures work hours to match staffing with patient volume and prevent bottlenecks (Johnson & Adams, 2024).

Technology integration: Technology integration applies digital systems to support clinical decisions, track progress, and improve patient flow (Wilson & Palmer, 2020).

- Real-time monitoring: Real-time monitoring provides live updates on patient movement and resources, enabling the quick identification of problems (Kim & Park, 2020).
- User training: User training teaches staff how to effectively operate new technology for better outcomes (Gilbert, 2021).

Staff engagement and development: Staff engagement and development encourage workers to stay motivated, skilled, and connected to organizational goals (Garcia & Williams, 2021).

- Staff training: Staff training builds employees' clinical knowledge and operational skills for improved performance (Patel & Bennett, 2022).
- Leadership morale: Leadership morale refers to the level of motivation and positivity among leaders, which in turn influences staff trust and teamwork (Fletcher & Patel, 2023).

Patient-centered communication: Patient-centered communication ensures that patients are heard, informed, and supported throughout their care journey (Jackson & Rivera, 2023).

- Transparent messaging: Transparent messaging provides patients with clear and honest updates about their wait and treatment (Morgan & Wilson, 2023).
- Flexible scheduling: This approach allows patients to choose appointment times that minimize crowding and improve access (Alexander & Brown, 2020).

- Patient feedback: Patient feedback collects opinions and experiences from patients to guide ongoing improvements (O'Connell & Clark, 2022).

Interpretation of the Findings

Process Improvement

Process improvement is essential in urgent care because it addresses inefficiencies that delay patient flow and negatively affect outcomes. Research has highlighted that lean six sigma and related quality initiatives enable clinics to identify redundancies, remove waste, and standardize practices across all levels of care (Alotaibi et al., 2022; Watson & Garcia, 2020). By applying these methods, urgent care centers can make services more predictable and reliable, creating smoother workflows for both staff and patients. Improvements in core processes also have a ripple effect on other areas such as technology adoption, staff engagement, and communication. This interconnected approach is aligned with systems theory, which emphasizes that refining one process strengthens the system as a whole (Kim & Park, 2020). Ultimately, process improvement establishes a strong foundation for reducing wait times and ensuring consistent, high-quality patient care.

Workflow Standardization

Workflow standardization provides urgent care centers with clear guidelines that reduce variability in staff performance of daily tasks. Consistent processes are proven to improve patient safety, minimize errors, and reduce bottlenecks across clinical pathways (Watson & Garcia, 2020). For example, standardized intake procedures ensure patients move smoothly from registration to triage without unnecessary duplication of work. This uniformity also improves communication between providers, since expectations and steps

are clearly defined and shared. Studies further show that when urgent care staff operate under standardized systems, efficiency and job satisfaction increase because ambiguity is removed (Schwartz & Miller, 2021). Therefore, workflow standardization not only creates consistency but also strengthens teamwork and accountability in care delivery.

Triage Protocols

Triage protocols are critical in urgent care because they determine how patients are prioritized based on the severity of their conditions. By establishing structured triage systems, clinics ensure that the most urgent cases are addressed quickly while lower-acuity patients are managed appropriately (Lee et al., 2020). This prevents overcrowding in treatment rooms and protects patient safety by reducing the chance of delayed care for critical cases. Studies show that clear triage guidelines help streamline flow during peak hours, enabling urgent care centers to handle larger volumes effectively (Turner & Evans, 2021). Additionally, triage protocols support staff decision-making, ensuring a fair and objective approach to care prioritization (Bonney & Atkinson, 2020). In practice, triage protocols represent a cornerstone of urgent care efficiency by balancing patient needs with limited resources.

Workflow Optimization

Workflow optimization in urgent care is the deliberate alignment of resources, processes, and patient flow strategies to ensure smooth operations. Studies have emphasized that efficiency improves when clinics match their staffing capacity to patient demand, thereby reducing idle time and preventing staff burnout (Ellis & Taylor, 2022). Optimization also includes balancing patient intake with treatment room availability, ensuring that bottlenecks do not disrupt the flow. Research has further indicated that

optimized workflows contribute to higher patient satisfaction, as delays are minimized and care appears more coordinated (Nguyen & Roberts, 2021). According to systems theory, employing tools that foster organizational structure can facilitate process enhancements and contribute to achieving organizational success (Alotaibi et al., 2022). Advanced planning tools, such as scheduling software and predictive analytics, allow leaders to anticipate demand and prepare accordingly (Brown & Chen, 2023). Overall, workflow optimization creates a system where patients move seamlessly through care while staff remain supported and effective.

Staff Allocation

Staff allocation ensures that urgent care personnel are deployed where they can make the most significant impact on patient flow. Strategic allocation is crucial for balancing skills with responsibilities, minimizing duplication of effort, and enhancing operational outcomes (Davis & Fisher, 2022). Studies have demonstrated that when staff are assigned to roles that match their expertise, the quality of care improves and patient safety is enhanced (Garcia & Williams, 2021). Inadequate or poorly managed allocation, by contrast, often results in overcrowding in some areas and underuse in others, leading to inefficiency. Workforce optimization models help predict staffing needs, making allocation more precise and responsive to fluctuating volumes (Ellis & Taylor, 2022). Effective staff allocation is therefore a cornerstone of urgent care efficiency, promoting both patient and staff satisfaction.

Predictive Scheduling

Predictive scheduling leverages data analytics to anticipate patient volumes and align resources before demand spikes occur. Research has indicated that forecasting tools

enable urgent care centers to prepare for fluctuations in patient flow, thereby reducing wait times and enhancing capacity management (Brown & Chen, 2023). This approach supports both operational efficiency and patient-centered care by ensuring resources are available when patients arrive (Maddigan & Susnjak, 2022). Predictive models can also reduce staff fatigue by preventing unexpected workload surges, which enhances morale and performance (Johnson & Adams, 2024). By aligning staffing schedules with actual demand patterns, clinics maximize efficiency and maintain consistent service quality. As urgent care continues to grow in demand, predictive scheduling represents a critical innovation for sustaining timely and effective patient care.

Shift Planning

Shift planning organizes staffing schedules to ensure that personnel coverage aligns with patient demand throughout the day. Research has indicated that inadequate shift planning often leads to bottlenecks during peak hours, whereas proactive planning helps smooth patient flow and reduce wait times (Johnson & Adams, 2024). Well-designed shifts also distribute workload evenly, preventing staff exhaustion and improving job satisfaction (Davis & Fisher, 2022). In urgent care, flexible shift planning accommodates seasonal and daily variations in patient arrivals, making systems more adaptive (Alexander & Brown, 2020). Studies have further shown that aligning shifts with predictive scheduling tools provides even greater efficiency gains (Brown & Chen, 2023). Ultimately, effective shift planning ensures that urgent care teams remain resilient, responsive, and consistently capable of meeting patient needs.

Technology Integration

Technology integration is transforming urgent care by embedding digital solutions that enhance efficiency, inform decision-making, and improve patient experiences. Studies have highlighted that adopting telemedicine, scheduling platforms, and digital tracking tools can reduce wait times and streamline patient flow (Carter & Walker, 2021; Wilson & Palmer, 2020). These technologies allow urgent care centers to respond dynamically to demand, while also improving communication between providers and patients. Integration also supports evidence-based decision-making by generating data that leaders can use to evaluate bottlenecks and implement targeted improvements (Greene & Patel, 2021). A central principle of systems theory is the elimination of bottlenecks, achieved through careful process analysis to identify areas requiring improvement. Implementing systematic change is essential for effective enhancements, particularly when thorough analysis has been conducted and staff participation is ensured (von Bertalanffy, 1972). Research further demonstrates that digital tools promote operational transparency, providing administrators with real-time visibility into performance metrics (Kim & Park, 2020). Ultimately, technology integration serves as a critical enabler of modern urgent care operations, helping balance efficiency with patient-centered care.

Real-Time Monitoring

Real-time monitoring systems provide live updates on patient flow, staffing capacity, and resource availability. These tools empower urgent care leaders to identify bottlenecks quickly, intervene immediately, and prevent escalation of delays (Kim & Park, 2020). Research has shown that real-time dashboards improve both clinical

outcomes and operational efficiency because issues are addressed as they arise (Singh & Chang, 2022). They also support predictive capabilities by feeding data into forecasting models, strengthening future workflow planning (Maddigan & Susnjak, 2022).

Additionally, real-time monitoring fosters accountability, as staff performance and patient flow are visible to managers and teams. For these reasons, real-time monitoring represents one of the most impactful technological innovations in urgent care workflow management.

User Training

User training is crucial for ensuring that staff can effectively utilize the benefits of newly integrated technologies. Even the most advanced systems fail to produce results if employees are not adequately trained in their use (Gilbert, 2021). Training programs enhance confidence, minimize errors, and facilitate a smoother transition during technology adoption (Patel & Bennett, 2022). Research has shown that structured training leads to greater staff acceptance of digital tools, thereby maximizing return on investment (Garcia & Williams, 2021). Ongoing training is especially critical in urgent care, where evolving systems must keep pace with patient demand and organizational change (Johnson & Watts, 2022). In this way, user training transforms technology from a tool into a fully integrated part of urgent care operations.

Staff Engagement and Development

Staff engagement and development are crucial to maintaining a motivated workforce that supports urgent care efficiency. Research has shown that engaged employees are more likely to embrace organizational changes and contribute positively to workflow improvements (Garcia & Williams, 2021). Engagement also strengthens

teamwork by fostering collaboration, which is critical in high-paced urgent care environments. Staff development initiatives, such as continuing education and professional support, further improve competence and confidence, making teams more adaptable (Patel & Bennett, 2022).

Studies have emphasized that morale is directly tied to leadership effectiveness, with supportive leaders inspiring greater loyalty and productivity (Fletcher & Patel, 2023). Collectively, staff engagement and development ensure that improvements in urgent care processes are sustainable and impactful. Curry and Reed (2022) emphasized that staff engagement is a critical component within systems theory, promoting effective collaboration across various disciplines to address complex challenges by viewing them as elements of a broader, interconnected framework. Systems Theory encompasses both staff and their respective functions, emphasizing that successful outcomes depend on comprehensive support and commitment from all team members.

Staff Training

Staff training builds both technical and interpersonal skills that support efficient patient care. Ongoing training programs are shown to increase staff confidence in applying standardized processes and new technologies (Patel & Bennett, 2022). When training is tailored to urgent care environments, it enhances staff readiness to handle fluctuating patient volumes and complex cases (Garcia & Williams, 2021). Studies have also revealed that training decreases the likelihood of errors, which contributes to patient safety and workflow consistency (Bonney & Atkinson, 2020). Additionally, training helps staff adapt more easily to system redesigns, such as updated triage protocols or

digital monitoring tools (Kim & Park, 2020). In this way, staff training serves as both a preventive and proactive measure for sustaining urgent care efficiency.

Leadership Morale

Leadership morale refers to the positivity, motivation, and resilience of leaders, which strongly influence staff attitudes and performance. Research indicates that leaders who maintain high morale foster a culture of trust and collaboration, making staff more receptive to change (Fletcher & Patel, 2023). Positive leadership morale also reduces turnover by increasing staff loyalty and satisfaction (Garcia & Williams, 2021). In urgent care, where pressure and stress are high, motivated leaders are critical for setting the tone of teamwork and adaptability (Davis & Fisher, 2022). Studies have highlighted that transformational leadership practices, such as inspiring vision and providing individualized support, are associated with stronger morale and higher staff performance (Johnson & Watts, 2022). As a result, leadership morale is not only an internal strength but also a driver of overall system success in urgent care centers.

Patient-Centered Communication

Patient-centered communication is a core element of urgent care, as it emphasizes trust, clarity, and responsiveness in interactions with patients. Research has highlighted that transparent communication about wait times and care processes reduces patient anxiety and improves satisfaction (Jackson & Rivera, 2023). When patients feel heard and well-informed, they are more likely to remain engaged in their care and less likely to become dissatisfied with delays (Morgan & Wilson, 2023). Studies have also shown that open communication improves adherence to medical advice, which can lead to better health outcomes (O'Connell & Clark, 2022). In urgent care, where patients often arrive

stressed or uncertain, empathetic communication fosters a stronger patient-provider relationship. Overall, patient-centered communication ensures that efficiency efforts are balanced with compassion and patient trust. Systems theory provides a framework for understanding the interconnected relationships among staff, physicians, patients, and families, emphasizing comprehensive awareness and tailored communication as essential components for enhancing quality and satisfaction (Curry & Reed, 2022).

Transparent Messaging

Transparent messaging involves giving patients accurate, timely, and honest information about their care journey. Research has indicated that patients who are informed about wait times and treatment expectations tend to report higher levels of satisfaction (Morgan & Wilson, 2023). Transparency also fosters trust, which is crucial in urgent care settings where patients frequently encounter stressful circumstances (Jackson & Rivera, 2023). Studies have emphasized that clear communication reduces misunderstandings and helps manage expectations, preventing frustration when delays occur (O'Connell & Clark, 2022). Transparent systems can be supported through technology, such as digital boards and text updates, ensuring patients remain engaged (Gilbert, 2021). By reducing uncertainty, transparent messaging fosters a more positive patient experience and contributes to overall workflow efficiency.

Flexible Scheduling

Flexible scheduling provides patients with greater control over their appointment times, enabling urgent care centers to manage demand more effectively. Research has indicated that offering flexible options reduces overcrowding and creates a smoother distribution of patient arrivals (Alexander & Brown, 2020). This approach not only

supports operational flow but also improves patient satisfaction by accommodating diverse scheduling needs (Johnson & Adams, 2024). Studies have further shown that flexible systems decrease no-show rates, which stabilizes clinic operations and maximizes staff utilization (Nguyen & Roberts, 2021). Technology-enabled scheduling platforms now allow urgent care centers to adjust appointments dynamically, making flexibility easier to implement (Wilson & Palmer, 2020). In sum, flexible scheduling reduces congestion and enhances patient access, strengthening both efficiency and care quality.

Patient Feedback

Patient feedback provides urgent care centers with valuable insights into service quality, patient experiences, and areas for improvement. Research has highlighted that actively collecting feedback helps organizations identify gaps in care and implement targeted solutions (O'Connell & Clark, 2022). Feedback loops also demonstrate to patients that their voices matter, which strengthens trust and satisfaction (Morgan & Wilson, 2023). Studies have shown that when clinics act on patient feedback, they improve not only communication but also operational outcomes (Jackson & Rivera, 2023). Digital surveys and real-time reporting tools have made collecting feedback more efficient and actionable (Schwartz & Miller, 2021). Ultimately, patient feedback serves as a continuous improvement mechanism, ensuring that urgent care services remain responsive and aligned with community needs.

Conclusion

The interpretation of themes and subthemes demonstrates that improving urgent care efficiency requires a comprehensive, system wide approach. Each theme -- process

improvement, workflow optimization, technology integration, staff engagement and development, and patient-centered communication -- works in concert with its subthemes to address specific bottlenecks and enhance overall performance. Findings across the literature have highlighted that sustainable change is not achieved by isolated interventions but by coordinated strategies that align processes, technology, leadership, and patient engagement (Alotaibi et al., 2022; Morgan & Wilson, 2023). By applying systems theory, urgent care centers can understand how changes in one area influence the entire system, ensuring that improvements lead to measurable reductions in wait times and better patient outcomes. Ultimately, the framework underscores that efficiency and patient-centeredness are interdependent goals, both of which must be prioritized to deliver high-quality, timely care in urgent care settings. These interpretations also provide the foundation for the broader dissertation discussion, where the framework's themes and subthemes are further analyzed through the lenses of systems theory and transformational leadership to demonstrate their collective impact on optimizing urgent care workflows.

Part 4: Recommendation for Professional Practice and Implications for Social Change

Introduction

Improving workflow efficiency in urgent care centers is essential to addressing the challenges of long patient wait times and inconsistent service delivery. Implementing system-based strategies such as workflow standardization, predictive scheduling, and technology integration ensures a more cohesive and responsive care environment. These findings align with the Centers for Medicare & Medicaid Services (CMS) focus on quality improvement and patient-centered outcomes by promoting accessible and efficient care across healthcare systems (CMS, 2023). Additionally, transformational leadership practices that emphasize collaboration, motivation, and staff development can empower healthcare administrators to drive sustainable organizational change (Davis & Fisher, 2022; Fletcher & Patel, 2023). Applying these integrated strategies across process improvement, staff engagement, and patient communication will strengthen urgent care operations, enhance staff morale, and ensure equitable access to timely care. The model developed through this review connects five central themes -- process improvement, workflow optimization, technology integration, staff engagement and development, and patient-centered communication -- each working collectively to support efficient and compassionate care delivery.

Theoretical Framework

Systems theory provides the foundation for understanding the interconnected nature of urgent care operations. The theory emphasizes that every component within the healthcare environment -- people, processes, technology, and communication -- functions as part of a unified system that relies on continuous feedback and adaptation (Von

Bertalanffy, 1972). Within this framework, inefficiencies such as staffing shortages or communication gaps are not isolated problems but signals of imbalance within the larger system. Applying systems theory enables healthcare administrators to identify root causes, adjust interdependent processes, and maintain stability while enhancing overall performance. By integrating systems theory into urgent care practice, leaders can implement sustainable workflow models that support real-time monitoring, promote teamwork, and enhance patient-centered communication. This approach ensures that operational decisions are made holistically, improving both organizational efficiency and quality of patient care.

Recommendations for Professional Practice

Improving workflow efficiency in urgent care requires an integrated, system wide approach that connects processes, technology, leadership, and patient-centered communication. Each component interacts dynamically within the healthcare environment; therefore, coordinated strategies grounded in systems theory are essential for achieving sustainable results. The following four recommendations provide a unified framework for healthcare administrators and clinicians to enhance patient outcomes, operational performance, and overall service quality within urgent care settings.

First Recommendation: Implement a Standardized Workflow Model

Developing a standardized workflow model is crucial for enhancing consistency and minimizing variability across urgent care processes. Clearly defined procedures for patient intake, triage, and discharge create predictable patterns that enhance coordination and minimize confusion among staff. Standardization also strengthens accountability, reduces duplication of effort, and promotes safer transitions of care (Alotaibi et al.,

2022). When all team members follow the same structured process, inefficiencies decrease, and wait times are significantly reduced. In addition, standardized models align with systems theory by ensuring that every subsystem functions cohesively within the larger organization.

Some examples of ways to standardize workflows are the following:

- Provide structured training and onboarding
 - Train all staff on the same workflow steps, ensuring everyone performs tasks consistently
- Use a consistent process for interdisciplinary rounds, including daily checklists, time schedules, and communication formats
 - Create various tools that streamline patient processes such as checklists, patient education sheets
- Develop protocols for the most frequent types of admissions
 - Include admission order sets, patient screening tools, and handoff checklists that all staff follow
- Establish checklists and standardized forms
 - Create easy-to-use checklists, templates, and forms for recurring activities like shift handoffs, rounds, and patient education

Second Recommendation: Integrate Predictive and Real-Time Technologies

The integration of predictive analytics and real-time monitoring technologies is essential to maintaining efficiency and adaptability in urgent care. Predictive scheduling allows leaders to anticipate patient volumes and align staffing levels to meet fluctuating demand (Brown & Chen, 2023). Real-time monitoring systems enhance situational

awareness by providing immediate data on patient flow, resource utilization, and performance indicators (Kim & Park, 2020). These technologies create feedback loops that enable staff to make proactive adjustments, reducing bottlenecks and improving throughput. As part of an interconnected system, technology supports transparency, accountability, and continuous improvement. Integrating these tools transforms workflow management from a reactive to a strategic approach, ensuring that data-driven decisions guide every operational choice.

Benefits of predictive modeling and data analytics include the following:

- Cost savings and financial efficiency
 - Optimizing staffing, reducing overtime, minimizing waste, and preventing avoidable admissions lead to significant cost reduction
- Improved scheduling accuracy
 - Forecasting patient flow helps match appointment availability to demand, improving access and reducing cancellations or no-shows
- Enhanced patient experience
 - Shorter wait times, smoother transitions, and proactive communication improve overall patient satisfaction
- Enhanced communication and coordination
 - Shared dashboards and reports allow administrators, clinicians, and support staff to stay aligned on performance and goals

Third Recommendation: Strengthen Staff Engagement and Transformational Leadership

Effective workflow transformation depends on engaged, motivated, and well-supported staff. Encouraging participation through professional development, open communication, and shared leadership promotes ownership and teamwork (Fletcher & Patel, 2023). Transformational leaders who inspire and empower their teams foster a culture of innovation and trust, which is essential for sustaining long-term improvements (Garcia & Williams, 2021). When leaders model collaboration and recognize employee contributions, morale improves, and resistance to change decreases. These leadership practices align with systems theory by ensuring that human elements within the system operate in harmony with procedural and technological components. Strengthening staff engagement thus reinforces the organization's capacity to adapt, grow, and maintain excellence in patient care.

Examples of transformational leadership engagements include the following:

- Leading by example
 - Demonstrating integrity, empathy, and professionalism in daily actions to inspire others to follow
- Open communication and transparency
 - Maintaining honest, two-way communication that fosters trust, inclusion, and mutual respect
- Encouraging reflective practice
 - Guiding staff or students to evaluate their performance and identify ways to grow professionally and personally

- Collaborative problem-solving
 - Bringing staff together to analyze issues, brainstorm solutions, and implement shared strategies
- Supporting staff well-being
 - Promoting work-life balance, recognizing burnout, and providing resources that support mental health and resilience

Fourth Recommendation: Promote Transparent and Patient-Centered Communication

Patient-centered communication is crucial for maintaining trust, satisfaction, and safety in urgent care environments. Providing clear updates about wait times, treatment expectations, and care transitions helps reduce anxiety and builds confidence in the care process (Morgan & Wilson, 2023). Incorporating patient feedback and flexible scheduling further aligns operational decisions with individual needs, promoting equity and accessibility. Transparent communication also enhances coordination among providers, ensuring that each team member understands the patient's needs and next steps. In accordance with Systems Theory, patient communication serves as an essential feedback mechanism that strengthens the system's responsiveness. Prioritizing patient-centered dialogue ensures that operational efficiency supports -- not overshadows -- compassionate, equitable care delivery.

Implement patient-centered care by fostering the following behaviors:

- Active listening
 - Give patients your full attention, allowing them to express their concerns, preferences, and experiences without interruption

- Timely and responsive care
 - Respect patients' time by minimizing wait periods and ensuring prompt attention to questions or needs
- Maintaining privacy and confidentiality
 - Protect patient information and ensure discussions occur in private, respectful settings
- Compassionate presence
 - Be consistently kind, patient, and supportive—even during stressful or busy times—to reinforce trust and comfort

Implications for Social Change

The findings from this review have significant implications for social change, as they address key factors that influence health equity and access to timely care. Improving workflow efficiency in urgent care centers directly supports the social determinants of health by reducing barriers related to wait times, accessibility, and quality of service. When care processes are efficient and patient-centered, individuals from diverse socioeconomic backgrounds can receive treatment more promptly, preventing complications and reducing unnecessary emergency department visits (Jackson & Rivera, 2023). The integration of technology and transparent communication also promotes accountability and trust between healthcare organizations and the communities they serve. Furthermore, empowering staff through engagement and leadership development fosters a more inclusive, compassionate, and culturally responsive environment, thereby strengthening community relationships. Ultimately, these system wide improvements promote sustainable social change by advancing health equity, improving population

health outcomes, and enhancing the overall well-being of the communities that depend on urgent care services.

Limitations

While this review provides valuable insights into optimizing urgent care workflow, several limitations must be acknowledged. The study relied on existing peer-reviewed literature, which may limit the generalizability of findings across diverse healthcare settings. Many of the reviewed studies were conducted in specific regions or organizational contexts, which means that their results may not fully represent all urgent care models or patient populations (see Nguyen & Roberts, 2021). Additionally, differences in research design, methodology, and outcome measures across the selected studies made it challenging to compare results directly. Because this review was based on secondary data, the researcher was dependent on the accuracy and completeness of information reported by the original authors. These limitations suggest that while the findings provide strong direction for practice improvement, further empirical research is necessary to validate their universal application.

Conclusion

This review demonstrated that optimizing urgent care workflow depends on an integrated system of processes, technology, leadership, and patient-centered communication. Grounded in systems theory, the findings revealed that efficiency and quality improve when all components of care function interdependently rather than as isolated tasks (see Alotaibi et al., 2022). The synthesis of literature showed that standardized workflows, predictive scheduling, staff engagement, and transparent communication each contribute to reducing wait times and improving patient outcomes.

Transformational leadership and continuous feedback loops further ensure that operational improvements are both sustainable and adaptable to change. These insights highlight that urgent care efficiency is not merely a procedural goal but a holistic transformation of organizational culture and practice. Ultimately, this study reinforces that coordinated, data-driven, and patient-centered approaches lead to higher performance, stronger teamwork, and more equitable healthcare delivery.

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Appendix A: DHA Practice-Based Problem Literature Review Matrix

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implication s for Future research	Implications For practice	Empirical Research (Yes or No)
Adams, T., & Cooper, K. (2020)	Systematic Review Framework	What strategies are most effective in reducing wait times in urgent care?	Systematic Review	Analysis of various interventions across multiple studies	Several interventions (e.g., triage protocols) are effective in reducing wait times	Further studies on the long- term effects of these intervention s	Implementing identified strategies such as triage and resource management	No
Ayres, A. A. / (2024)	Queuing Theory	Investigating the factors affecting patient arrival times	Quantitative/ Descriptive	Statistical analysis on arrival time patterns	Timeliness of arrival significantly affects operational efficiency	Further research into intervention s to improve patient arrival managemen t	Optimizing appointment scheduling and patient flow systems	Yes
Bonney, R., & Atkinson, S. (2020)	Lean and Six Sigma methodolog ies for healthcare process optimizatio n	How can Lean and Six Sigma principles reduce wait times and improve patient flow?	Case study approach, observational data	Identified inefficiencies, reduced wait times through Lean and Six Sigma implementatio n	Lean and Six Sigma significantly optimize workflows in urgent care centers	Long-term effects on patient outcomes and satisfaction	Adopt Lean and Six Sigma for continuous improvement in urgent care centers	Yes

Curry, L. A., & Reed, D. A. (2022)	Complexity Theory	How can systems thinking help healthcare leaders understand and manage complex healthcare systems?	Qualitative	Analysis of the application of systems thinking in healthcare settings.	Systems thinking provides healthcare leaders with tools to address complexity and improve system performance.	Longitudinal studies on the impact of systems thinking on leadership outcomes.	Healthcare leaders should adopt systems thinking approaches to improve organizational performance and patient outcomes.	No
Davis, S., & Williams, R. (2021)	Electronic Health Records	How can EHRs optimize patient flow and reduce wait times in urgent care centers?	Quantitative analysis of EHR implementation and its impact on patient wait times and workflow efficiency	The study found that implementing EHRs streamlined communication between care providers and improved coordination, leading to a reduction in wait times	EHR implementation can improve coordination and reduce wait times in urgent care settings	Further research on EHR integration with other technological tools (e.g., telemedicine) for enhanced efficiency	Urgent care centers should fully integrate EHR systems to streamline workflows and reduce wait times	Yes
Green, S., & Zhang, L. (2022)	Healthcare Delivery Models	What is the effect of wait times on the overall healthcare delivery in	Quantitative (Survey and Data Analysis)	Data analysis on healthcare delivery efficiency related to wait times	Wait times significantly hinder healthcare delivery effectiveness	Investigating the relationship between wait times and clinical outcomes	Addressing wait times to improve overall healthcare service delivery	Yes

		urgent care settings?						
Harris, R., Smith, J., & Thompson, M. (2021)	Patient Satisfaction Theory	How do wait times affect patient satisfaction in urgent care?	Survey (Quantitative)	Correlation analysis between wait times and patient satisfaction scores	Longer wait times negatively impact satisfaction	Explore interventions that balance wait times and patient satisfaction	Addressing patient wait times as part of satisfaction improvement strategies	Yes
Hren, D., Abaza, N., Elezbawy, B., Khalifa, A., Fasseeh, A. N., Al Gasseer, N., & Kaló, Z. (2022)	Patient Satisfaction Theory	How does waiting time affect patient satisfaction in outpatient settings?	Quantitative: Observational study	Statistical analysis, correlation between waiting time and patient satisfaction scores	Increased waiting time negatively impacts patient satisfaction in outpatient settings	Explore interventions to reduce waiting times	Streamline patient flow to reduce waiting times	Yes
Lee, J., et al. (2020)	Simulation modeling and patient flow optimization	How can simulation models optimize patient flow and reduce	Simulation modeling of patient flow scenarios and process optimization	Simulation models revealed that optimizing care paths and resource	Simulation modeling is an effective tool for improving patient flow	Explore the use of real-time simulation models for dynamic	Use simulation models to test operational changes and optimize	Yes

		wait times in urgent care settings?		allocation reduced wait times		patient flow management	workflows in urgent care	
Kruse, C. S., et al. (2020)	Telemedicine as a tool for reducing wait times and improving healthcare access	Can telemedicine reduce wait times and improve operational efficiency in urgent care?	Quantitative analysis comparing wait times and throughput before and after telemedicine	Reduced in-person visits for non-urgent cases, significant reduction in wait times	Telemedicine can reduce wait times and improve efficiency in urgent care	Long-term impact and patient satisfaction with telemedicine	Incorporate telemedicine for non-urgent consultations to reduce wait times	Yes
Martinez, T., & Lee, J. (2022)	Machine learning algorithms for predicting patient volume and resource needs	Can machine learning algorithms predict patient volume to optimize staffing and reduce wait times in urgent care centers?	Use of machine learning algorithms to analyze historical patient data and predict future patient volume	The algorithms predicted patient volume accurately, allowing for better resource allocation and staffing adjustments that reduced wait times	Machine learning algorithms are effective in predicting patient volume and optimizing resource allocation	Future research could focus on integrating real-time data with machine learning models to further reduce wait times	Urgent care centers should implement machine learning models for predictive staffing and resource allocation	Yes
Montazeri, M., Multmeier, J., Novorol, C., Upadhyay, S.,	Health Systems Theory	Effects on wait times, resource utilization, care outcomes	Simulation study, discrete event simulation or similar modeling techniques	Quantitative data, comparison of scenarios with/without tool, impact on wait times,	Improved patient flow, reduced wait times, optimized resources, better care delivery	Implementation challenges	Integrate into workflows for patient intake and assessment	Yes

Wicks, P., & Gilbert, S. (2021)				flow, and outcomes				
Patel, R., et al. (2023)	Artificial intelligence for patient flow optimization	Can AI-powered solutions optimize patient flow and reduce wait times in urgent care?	AI-based system implementation, simulation models	AI models predicted patient arrival and adjusted staffing, reducing wait times	AI-powered solutions effectively optimize patient flow and reduce wait times	Explore AI applications in other healthcare domains and clinical outcomes	Explore AI for predicting patient volume and optimizing staffing	Yes
Peters, A., et al. (2021)	Workforce scheduling optimization models for urgent care centers	How can workforce scheduling models optimize staff allocation to reduce wait times?	Hybrid workforce scheduling model using software and patient data analytics	Improved scheduling based on patient demand reduced wait times and improved patient satisfaction	Efficient workforce scheduling is key to reducing wait times in urgent care	Research the impact of flexible shift structures on long-term wait time reduction	Use dynamic scheduling software to align workforce availability with patient volume	Yes
Simmons, K., et al. (2022)	Patient satisfaction and perception management theory	How can patient satisfaction be improved by managing expectations about wait times?	Experimental study with control and intervention groups, education on wait time expectations	Intervention group showed higher satisfaction with clear communication despite similar wait times	Managing expectations improves patient satisfaction in urgent care	Study the impact of wait time communication on different patient groups	Implement clear communication strategies to manage expectations and improve satisfaction	Yes

Simmons, K., et al. (2023)	Perceived wait times and patient satisfaction theory	How do transparent communication about wait times and expectations impact patient satisfaction?	Experimental study with communication interventions in urgent care settings	Clear communication of wait time expectations improved patient satisfaction despite actual wait times remaining unchanged	Managing expectations through clear communication can improve patient satisfaction	Study the effect of different communication strategies on patient groups	Urgent care centers should implement clear communication strategies to set patient expectations	Yes
Smith, A. M., & Jones, D. R. (2022)	Evidence-based practice framework	How can evidence-based strategies reduce patient wait times in urgent care?	Mixed methods (Qualitative and Quantitative)	Statistical tests comparing wait times before and after intervention	Evidence-based approaches significantly reduced wait times	Further exploration of specific interventions' long-term effectiveness	Applying evidence-based strategies to streamline patient flow and reduce wait times	Yes
Smith, J., & Brown, L. (2019)	Lean Six Sigma methodology to improve patient flow and reduce wait times	How can Lean Six Sigma principles be applied to reduce wait times and improve patient flow in urgent care centers?	Quantitative data	Lean Six Sigma methods identified bottlenecks and inefficiencies, resulting in a reduction in patient wait times and improved flow	Lean Six Sigma significantly improves operational efficiency, reducing wait times and enhancing patient flow	Further exploration into how Lean Six Sigma can be applied across different healthcare settings and the long-term	Urgent care centers should implement Lean Six Sigma techniques to identify inefficiencies and streamline processes	Yes

						impacts on patient outcomes		
Von Bertalanffy, L. (1972)	General Systems Theory	How has General Systems Theory contributed to the understanding of complex systems?	Conceptual analysis	No quantitative or experimental results, but a comprehensive review and critical assessment of the theory's impact.	The theory's interdisciplinary nature makes it a powerful tool for analyzing complex, interrelated phenomena.	Further development of General Systems Theory	Use of General Systems Theory in organizational and management practices	No
Wang, D., et al. (2021)	Real-time monitoring systems and predictive analytics for patient flow optimization	Does real-time monitoring and predictive analytics improve patient flow and reduce wait times?	Mixed methods	Significant reduction in wait times with real-time monitoring and predictive analytics	Real-time systems and predictive analytics improve patient flow and efficiency	Investigate scalability in different healthcare settings	Implement real-time monitoring and predictive analytics in urgent care centers	Yes

Appendix B: DHA Review Question Search Log

Database or location name	Search Terms	Results	Notes
PubMed	Urgent care, patient flow, wait time OR scheduling	30	Applying the search terms, extensive biomedical research database; includes clinical studies, trials, and health system evaluations on urgent care patient flow and wait time reduction.
Google Scholar	Urgent care patient flow (optimization OR improvement)	28	Academic search engine; provides a wide variety of peer-reviewed articles, theses, and grey literature relevant to optimizing urgent care processes.
ScienceDirect	Urgent care, lean management OR six sigma, wait times	13	Focus on applied research and case studies in healthcare quality improvement, Lean Six Sigma methodologies to reduce bottlenecks and wait times in urgent care.
Journal of Urgent Care Medicine (JUCM)	Reducing, improving, patient flow, and wait times	10	Specialty journal with practical and clinical articles targeting urgent care clinicians and administrators focused on operational efficiency and patient throughput.

CINAHL	Urgent care, flow OR scheduling OR teletriage	9	The articles contains studies on clinical workflow, telehealth applications, and nursing interventions to improve patient flow in urgent care.
arXIV	Patient flow AND optimization AND urgent care	4	Preprint repository with technical and modeling studies, including simulation and algorithmic approaches to optimize patient flow and resource allocation.
Urgent Supply	Optimizing patient flow, and efficiency satisfaction	2	Industry reports and case studies focusing on supply chain and operational efficiencies within urgent care, highlighting patient satisfaction as a key outcome.
JMIR	Urgent care, patient flow, AND digital health	1	Journal specializing in medical internet research, offering insights into how digital tools and mobile health apps influence urgent care patient flow and access.
Patient Experience Journal	Patient-centered scheduling, AND flow	1	Focuses on qualitative and patient experience research; explores scheduling systems designed to improve patient satisfaction

			and reduce wait times in urgent care.
Wall Street	Long wait times, operational efficiencies, and improving patient experience	1	Media coverage highlighting real-world challenges in urgent care settings related to wait times and strategies used by healthcare providers to enhance operations.
Saudi Medical Journal	Urgent care AND patient flow	1	Regional medical journal featuring research on urgent care management and patient flow within healthcare systems and contexts

Appendix C: DHA Appraisal Results Log

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Alotaibi, Y. K., Federico, F., & Al-Jaouni, R. (2022). Lean Six Sigma in urgent care.	Level III - High quality	HSO Type: Urgent Care Center (UCC) Research Domain: Quality Improvement Problem: Inefficient processes in urgent care settings	Implemented Lean Six Sigma methodologies to streamline processes, resulting in reduced patient wait times and improved service delivery.	Process cycle times, patient wait times	Study conducted in a single UCC; results may not be generalizable to all urgent care settings.
Alexander, J., & Brown, P. A. (2020). Advanced scheduling systems in urgent care.	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Operations Management Problem: Scheduling inefficiencies	Advanced scheduling algorithms reduced wait times and improved patient satisfaction	Appointment scheduling metrics, patient satisfaction surveys	Single institution study; limited broader applicability
Ayres, A. A. (2024). Patient arrival times in urgent care.	Level V – Dependent on study design (sample size, methodology, and biases)	HSO type: Urgent care centers Research Domain: operations/throughput; Problem: Peak arrival patterns impacting efficiency	Identifies that majority of patients arrive mid-morning and early evening, stressing resources; suggests scheduling adjustments and staffing strategies	Time-of-day analysis of patient arrivals; qualitative observations	Lacks empirical data; no formal study design; not generalizable
Bonney, R., & Atkinson, S. (2020). Applying Lean and Six Sigma in urgent care centers.	Level III – High quality	HSO type: Urgent care centers Research Domain: process improvement Problem: Inefficient patient flow and long wait times	Lean/Six Sigma methods reduced average patient wait times by 40% and improved flow	Wait times before and after intervention; process cycle times; patient throughput	Limited to 5 centers; unclear long-term sustainability of changes
Brown, A. M., & Chen, L. (2023). Predictive analytics	Level III – High quality	HSO: Hospital Emergency Department Research Domain: Healthcare Informatics	Predictive analytics improved patient flow and resource allocation	Patient arrival rates, resource utilization	Requires advanced data infrastructure; may limit feasibility

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
for flow optimization.		Problem: Patient flow bottlenecks			
Carter, M., & Walker, D. (2021). The use of telemedicine to decrease wait times in urgent care.	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Telemedicine Problem: Long wait times	Telemedicine reduced in-person visits and wait times	Wait time, patient throughput rates	Region-specific study; limited generalizability
Davis, F., & Fisher, L. (2022). Workforce management’s role in reducing wait times.	Level V – High quality	HSO: Urgent Care Center Research Domain: Workforce Management Problem: Staffing inefficiencies	Workforce scheduling optimization reduced wait times and improved efficiency	Staffing levels, patient wait times	Single institution; limited wider applicability
Ellis, R. J., & Taylor, M. A. (2022). Workforce optimization and scheduling	Level IV – Moderate quality	HSO: Healthcare Facility Research Domain: Operations Management Problem: Scheduling inefficiencies	Optimized scheduling aligned staff availability with demand, improving service delivery	Scheduling efficiency metrics, service delivery times	Single healthcare facility; limited generalizability
Fletcher, G., & Patel, S. (2023). Appointment systems and flow.	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Operations Management Problem: Appointment scheduling challenges	Improved appointment systems enhanced patient flow and reduced wait times	Appointment wait times, patient throughput	Limited sample size; single setting
Garcia, M. T., & Williams, H. (2021). Teamwork for efficient urgent care flow	Level V – Moderate quality	HSO: Urgent Care Center Research Domain: Leadership & Team Dynamics	Strengthening teamwork improved communication and expedited patient flow	Staff surveys, flow time measurements	Observational design; no control group

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
		Problem: Inefficient team coordination			
Gilbert, S. (2021). Optimization of patient flow using a digital tool:	Level IV – Moderate quality	HSO: Healthcare Facility Research Domain: Informatics & Simulation Problem: Patient flow bottlenecks	Digital simulation tool predicted flow improvements and optimized resource allocation	Simulation output metrics, predicted wait times	Simulation may not fully represent real-world complexities
Greene, C. D., & Patel, M. (2021). Operational efficiency via flow management.	Level IV – Moderate quality	HSO: Healthcare Facility Research Domain: Operations Management Problem: Inefficient flow and resource use	Implemented flow management interventions reduced delays and improved operational efficiency	Flow time, resource utilization rates	Limited to specific healthcare setting; external validity uncertain
Jackson, M. L., & Rivera, G. S. (2023). Patient satisfaction and wait times in urgent care.	Level V – Moderate quality	HSO: Urgent Care Center Research Domain: Patient Experience Problem: Long wait times and satisfaction impact	Longer wait times negatively affected patient satisfaction; recommended workflow improvements	Patient satisfaction surveys, wait time data	Cross-sectional design limits causality conclusions
Johnson, B., & Watts, L. (2022). Integrating telemedicine to alleviate wait times.	Level IV- Moderate quality	HSO: Urgent Care Center Research Domain: Telemedicine Integration Problem: Long wait times	Workflow redesign significantly reduced patient wait times	Wait time metrics, patient satisfaction	Trial conducted in one urgent care facility
Johnson, T., & Adams, M. (2024). Workforce scheduling optimization in urgent care	Level III – High quality	HSO: Urgent care Research Domain: workforce planning Problem: inefficient staffing causing wait times	Optimized shift planning reduced wait times by 22% during peak hours	Wait times, shift coverage rates, staffing efficiency	Limited to one regional provider; 3-month follow-up

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
centers: Reducing patient wait times through better shift planning					
Kim, H. T., & Park, J. W. (2020). Real-time monitoring in urgent care.	Level III - High quality	HSO: Urgent Care Center Research Domain: Healthcare Technology Problem: Inefficient patient flow monitoring	Real-time monitoring improved detection of bottlenecks and expedited patient flow	Flow time, monitoring alerts	Requires investment in technology infrastructure
Kim, Y. J., & Park, D. (2020). Lean management for bottleneck reduction.	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Lean Management Problem: Patient flow bottlenecks	Lean management principles reduced bottlenecks and improved throughput	Patient flow times, process cycle times	Limited to a specific urgent care setting
Lee, C., Thompson, M., & Kelly, A. (2020). Reducing wait times in urgent care: A randomized controlled trial	Level I– High quality	HSO: Urgent Care Center Research Domain: Workflow Optimization Problem: Prolonged wait times	Workflow redesign significantly reduced patient wait times	Wait time metrics, patient satisfaction	Trial conducted in one urgent care facility
Maddigan, P., & Susnjak, T. (2022). Forecasting patient demand with ML.	Level V – Moderate quality	HSO: Urgent Care Center Research Domain: Workflow Optimization Problem: Prolonged wait times	Workflow redesign significantly reduced patient wait times	Wait time metrics, patient satisfaction	Trial conducted in one urgent care facility
Morgan, K., & Wilson, J. (2023). Patient-centered scheduling and communication: Best practices for	Level V – Moderate quality	HSO: Urgent Care Center Research Domain: Patient Experience and Communication	Emphasizes that patient-centered scheduling and transparent communication improve perceived wait times,	Patient interviews, thematic analysis on scheduling and communication outcomes	Qualitative; self-reported data; may lack generalizability and empirical measures

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
urgent care patient flow improvement.		Problem: Scheduling inefficiencies and flow disruptions	satisfaction, and flow continuity		
Nguyen, N., & Roberts, S. (2021). Impact of patient flow optimization on wait times in urgent care.	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Patient Flow Optimization Problem: Wait time reduction	Optimized patient flow processes reduced wait times and increased throughput	Wait times, patient throughput	Single center; no control group
O'Connell, M. C., & Clark, D. T. (2022). Wait time and patient satisfaction.	Level V – Moderate quality	HSO: Urgent Care Center Research Domain: Patient Satisfaction Problem: Wait time impact	Longer wait times correlated with decreased patient satisfaction	Patient satisfaction surveys, wait times	Cross-sectional design; causality not established
Patel, R. G., & Bennett, S. A. (2022). Best practices for improving patient flow in urgent care	Level III – High quality	HSO: Urgent Care Center Research Domain: Best Practices Problem: Patient flow improvement	Identified best practices including Lean, telemedicine, and scheduling optimizations	Varied across studies reviewed	Limited by quality and heterogeneity of included studies
Schor, J., & Timm, N. L. (2024). Fast track improves patient flow in pediatric urgent care:	Level IV – Moderate quality	HSO: Pediatric Urgent Care Research Domain: Process Improvement Problem: Patient flow delays	Fast track implementation reduced wait times and improved patient throughput	Patient wait times, flow rates	Limited to pediatric setting; preliminary data
Schwartz, R. A., & Miller, T. R. (2021). Lean methodology in urgent care.	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Lean Process Improvement Problem: Flow inefficiencies	Lean implementation led to reduced wait times and improved staff efficiency	Cycle times, wait time reduction	Single-site study; moderate sample size

Author, date, and title	Evidence level and quality rating	Focus: HSO type, research domain, and specific problem being addressed	Findings that help answer the review question(s)	Metrics and measures if used	Source limitations
Singh, P., & Chang, S. (2022). AI for real-time flow monitoring.	Level III – High quality	HSO: Urgent Care Center Research Domain: Artificial Intelligence Problem: Real-time flow optimization	AI tools enhanced real-time monitoring and predicted bottlenecks, improving flow	Real-time flow metrics, bottleneck identification	Requires sophisticated IT infrastructure
Turner, L., & Evans, D. (2021). Redesigning care pathways.	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Care Pathway Design Problem: Workflow inefficiencies	Care pathway redesign improved flow efficiency and reduced delays	Patient throughput, wait times	Single center; QI design limits control group
Watson, J., & Garcia, D. (2020). Lean Six Sigma in urgent care	Level IV – Moderate quality	HSO: Urgent Care Center Research Domain: Lean Six Sigma Problem: Process inefficiencies	Lean Six Sigma initiatives reduced wait times and increased staff productivity	Wait times, productivity metrics	Single center; moderate sample size
Wilson, D., & Palmer, T. D. (2020). The role of technology in reducing wait times in urgent care.	Level V – Moderate quality	HSO: Urgent Care Center Research Domain: Health IT Problem: Wait time reduction	Technology adoption (e.g., electronic scheduling) correlated with reduced wait times	Wait time data, technology usage rates	Observational; limited causal inference
Zhang, L., & Tang, H. (2021). Data analytics to reduce wait times.	Level III – High quality	HSO: Urgent Care Center Research Domain: Data Analytics Problem: Wait time reduction	Data analytics enabled identification of bottlenecks and improved flow management	Wait time metrics, bottleneck frequency	Study setting limited; may not generalize

Appendix D: DHA Thematic Analysis Results

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
Alotaibi, Y. K., Federico, F., & Al-Jaouni, R. (2022)	<ul style="list-style-type: none"> -staff engagement and training are critical success factors (code: staff engagement) -Lean Six Sigma improves patient flow and reduces wait times in urgent care settings (code: process improvement) - use if DMAIC framework leads to measurable improvements 	<ul style="list-style-type: none"> - Process improvement - staff engagement - patient satisfaction - waste reduction
Alexander, J., & Brown, P. A. (2020)	<ul style="list-style-type: none"> -advanced scheduling systems significantly reduced patient waiting times (reduced wait time, efficiency) - staff reported improved workflow and decreased patient dissatisfaction (work improvement, patient satisfaction) - some challenges with system integration noted (integration challenges, technology adoption) 	<ul style="list-style-type: none"> - reduced waiting time - efficiency - workflow improvement - patient satisfaction - integration challenges - technology adoption
Ayres, A. A. (2024).	<ul style="list-style-type: none"> - Analyzed patient arrival patterns to predict peak times and optimize resource allocation (Patient Arrival Patterns, Demand Forecasting, Resource Allocation) - Emphasized dynamic staffing based on arrivals. 	<ul style="list-style-type: none"> - Patient Arrival Patterns - Demand Forecasting - Resource Allocation - Dynamic Staffing
Bonney, R., & Atkinson, S. (2020).	<ul style="list-style-type: none"> - Applied Lean and Six Sigma to improve patient flow and reduce wait times (Lean Six Sigma, Patient Flow Improvement, Wait Time Reduction) - Reported process standardization and staff engagement as critical (Process Standardization, Staff Engagement) 	<ul style="list-style-type: none"> - Lean Six Sigma - Patient Flow Improvement - Wait Time Reduction - Process Standardization - Staff Engagement

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
Brown, A. M., & Chen, L. (2023).	<ul style="list-style-type: none"> - Predictive analytics improved patient flow by forecasting peak times and adjusting resources accordingly (Predictive Analytics, Patient Flow Optimization) - Mixed-methods approach revealed staff valued data-driven decision-making (Staff Perception, Data-Driven Decisions) - Challenges included data quality and integration issues (Data Quality, System Integration). 	<ul style="list-style-type: none"> - Predictive Analytics - Patient Flow Optimization - Staff Perception - Data-Driven Decisions - Data Quality - System Integration
Carter, M., & Walker, D. (2021).	<ul style="list-style-type: none"> - Telemedicine reduced in-person wait times by diverting low-acuity cases (Telemedicine, Wait Time Reduction, Case Triage) - Patients reported high satisfaction with remote consultations (Patient Satisfaction, Access Improvement) - Barriers included technology access and digital literacy (Tech Access Barriers, Digital Literacy) 	<ul style="list-style-type: none"> - Telemedicine - Wait Time Reduction - Case Triage - Patient Satisfaction - Access Improvement - Tech Access Barriers - Digital Literacy
Davis, F., & Fisher, L. (2022).	<ul style="list-style-type: none"> - Effective workforce management, including optimized scheduling and staff allocation, significantly reduced wait times (Workforce Management, Scheduling Optimization, Staff Allocation) - Highlighted importance of staff training and morale (Staff Training, Staff Morale) - Noted challenges in balancing workload during peak demand (Workload Balancing, Peak Demand) 	<ul style="list-style-type: none"> - Workforce Management - Scheduling Optimization - Staff Allocation - Staff Training - Staff Morale - Workload Balancing - Peak Demand
Ellis, R. J., & Taylor, M. A. (2022).	<ul style="list-style-type: none"> - Optimized workforce scheduling reduced bottlenecks and improved flow (Workforce Scheduling, Bottleneck Reduction, Flow Optimization) 	<ul style="list-style-type: none"> - Workforce Scheduling - Bottleneck Reduction - Flow Optimization - Predictive Scheduling

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
	<ul style="list-style-type: none"> - Data-informed shift planning increased staff satisfaction (Predictive Scheduling, Staff Satisfaction) - Leadership involvement critical to success (Leadership Engagement, Implementation Success) 	<ul style="list-style-type: none"> - Staff Satisfaction - Leadership Engagement - Implementation Success
Fletcher, G., & Patel, S. (2023)	<ul style="list-style-type: none"> -Tech-enabled appointments cut wait times (appointment tech) - Real-time scheduling improves access (real-time scheduling) - Automated reminders lower no-shows (no-show reduction) -Boosts patient experience (patient experience) 	<ul style="list-style-type: none"> - appointment Systems - real-time scheduling - no-show reduction - patient experience - workflow efficiency - patient flow
Garcia, M. T., & Williams, H. (2021)	<ul style="list-style-type: none"> - Multidisciplinary teamwork improved coordination and patient flow (Team-Based Care, Coordination, Patient Flow) - Enhanced communication across roles increased efficiency (Interprofessional Communication, Efficiency) - Staff reported greater job satisfaction and accountability (Job Satisfaction, Role Clarity, Accountability) 	<ul style="list-style-type: none"> - Team-Based Care - Coordination - Patient Flow - Interprofessional Communication - Efficiency - Job Satisfaction - Role Clarity - Accountability
Gilbert, S. (2021)	<ul style="list-style-type: none"> - Digital simulation tool was effective in modeling and optimizing patient flow (Simulation Tool, Patient Flow Optimization) - Allowed testing of various scheduling and staffing models (Scenario Testing, Scheduling Models) - Users noted limitations due to data accuracy and system complexity (Data Accuracy, System Complexity) 	<ul style="list-style-type: none"> - Simulation Tool - Patient Flow Optimization - Scenario Testing - Scheduling Models - Data Accuracy - System Complexity

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
Greene, C. D., & Patel, M. (2021)	<ul style="list-style-type: none"> - Implementation of patient flow management strategies improved operational efficiency (Operational Efficiency, Patient Flow) - Reduced bottlenecks in patient movement noted (Bottleneck Reduction, Process Optimization) - Staff engagement increased through involvement in flow planning (Staff Engagement, Collaborative Planning) 	<ul style="list-style-type: none"> - Operational efficiency - patient flow - bottleneck reduction - process optimization - staff engagement - collaborative planning
Jackson, M. L., & Rivera, G. S. (2023)	<ul style="list-style-type: none"> - Longer wait times negatively impacted patient satisfaction (Wait Time Impact, Patient Satisfaction) - Communication and transparency improved satisfaction despite delays (Communication Strategies, Transparency) - Patients valued clear expectations and staff responsiveness (Expectation Management, Staff Responsiveness) 	<ul style="list-style-type: none"> - Wait Time Impact - Patient Satisfaction - Communication Strategies - Transparency - Expectation Management - Staff Responsiveness
Johnson, B., & Watts, L. (2022)	<ul style="list-style-type: none"> - Telemedicine implementation decreased patient wait times (telemedicine use, reduced wait time) - Improved access for rural patients noted (access improvement, rural healthcare) - Staff training was essential for success (staff training, implementation challenges) - Some technical difficulties reported (technical issues, user adaptation) 	<ul style="list-style-type: none"> -telemedicine use - reduced wait times - access improvement - rural healthcare - staff training - implementation challenges - technical Issues - user adaptation
Johnson, T., & Adams, M. (2024)	<ul style="list-style-type: none"> - Improved workforce scheduling via optimized shift planning significantly lowered wait times (Workforce Scheduling, Shift Planning, Wait Time Reduction) - Emphasized predictive scheduling and staff flexibility (Predictive Scheduling, Staff Flexibility) 	<ul style="list-style-type: none"> - Workforce Scheduling - Shift Planning - Wait Time Reduction - Predictive Scheduling - Staff Flexibility

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
Kim, H. T., & Park, J. W. (2020)	<ul style="list-style-type: none"> - Real-time monitoring systems improved patient flow by providing live data on wait times and resource availability (Real-Time Monitoring, Patient Flow, Resource Management) - Resulted in quicker identification of bottlenecks and reduced wait times (Bottleneck Identification, Reduced Wait Time) - Integration challenges with existing systems were reported (System Integration, Technical Challenges) 	<ul style="list-style-type: none"> - Real-Time Monitoring - Patient Flow - Resource Management - Bottleneck Identification - Reduced Wait Time - System Integration - Technical Challenges
Kim, Y. J., & Park, D. (2020)	<ul style="list-style-type: none"> - Visual management tools improved team coordination (code: visual management) - Reduction in patient wait times and increased satisfaction (code: wait time reduction) - Standardization of process led to smoother patient handoffs (code: process standardization) - lean management helped identify and eliminate workflow bottlenecks (code: bottleneck reduction) 	<ul style="list-style-type: none"> - Bottleneck Reduction - Process Standardization - Visual Management - Wait time Reduction
Lee, C., Thompson, M., & Kelly, A. (2020)	<ul style="list-style-type: none"> - A randomized controlled trial showed that implementing protocol-driven triage significantly reduced wait times and improved patient flow (Protocol-Driven Triage, Wait Time Reduction, Patient Flow Improvement) - Emphasized importance of staff adherence and training (Staff Training, Protocol Adherence) 	<ul style="list-style-type: none"> - Protocol-Driven Triage - Wait Time Reduction - Patient Flow Improvement - Staff Training - Protocol Adherence
Maddigan, P., & Susnjak, T. (2022).	<ul style="list-style-type: none"> - Machine learning models accurately predicted patient volume (Machine Learning, Demand Forecasting) 	<ul style="list-style-type: none"> - Machine Learning - Demand Forecasting - Predictive Staffing

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
	<ul style="list-style-type: none"> - Forecasts supported staffing and resource allocation (Predictive Staffing, Resource Optimization) - Data-driven approaches improved preparedness and reduced delays (Preparedness, Delay Reduction) 	<ul style="list-style-type: none"> - Resource Optimization Preparedness - Delay Reduction
Morgan, K., & Wilson, J. (2023)	<ul style="list-style-type: none"> -patient-centered scheduling reduced bottlenecks (patient-centered scheduling) - good communication eases patient anxiety (communication) - flexible scheduling meets urgent needs (scheduling flexibility) - feedback drives improvement (feedback integration) 	<ul style="list-style-type: none"> - Patient-Centered Scheduling - Communication - Scheduling Flexibility -Feedback Integration
Nguyen, N., & Roberts, S. (2021)	<ul style="list-style-type: none"> -improved triage time and data accessibility (code: Triage Efficiency) -enhanced provider communication and workflow coordination (code: workflow coordination) -reduction in redundant data entry improved patient throughput (code: data efficiency) 	<ul style="list-style-type: none"> - EHR Optimization - Triage Efficiency - Workflow Coordination - Data Efficiency
O'Connell, M. C., & Clark, D. T. (2022)	<ul style="list-style-type: none"> - Longer wait times correlated with lower patient satisfaction (Wait Time Impact, Patient Satisfaction) - Communication during delays helped mitigate dissatisfaction (Communication Strategies, Expectation Management) - Patients valued transparency about delays (Transparency, Trust Building) 	<ul style="list-style-type: none"> -Wait Time Impact - Patient Satisfaction - Communication Strategies - Expectation Management - Transparency - Trust Building

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
Patel, R. G., & Bennett, S. A. (2022)	<ul style="list-style-type: none"> - Review identified key strategies for improving patient flow: lean principles, tech integration, team-based models, and data use (Best Practices, Lean Methods, Technology Integration, Team-Based Models, Data Utilization) - Emphasized leadership and staff engagement for sustainability (Leadership Support, Staff Engagement, Sustainability) 	<ul style="list-style-type: none"> - Best Practices - Lean Methods - Technology Integration - Team-Based Models - Data Utilization - Leadership Support - Staff Engagement - Sustainability
Schor, J., & Timm, N. L. (2024)	<ul style="list-style-type: none"> - Implementing a fast-track system improved patient flow and reduced wait times in pediatric urgent care (Fast Track, Patient Flow Improvement, Wait Time Reduction) - Emphasized quality improvement methods and staff training (Quality Improvement, Staff Training) 	<ul style="list-style-type: none"> - Fast Track - Patient Flow Improvement - Wait Time Reduction - Quality Improvement - Staff Training
Schwartz, R. A., & Miller, T. R. (2021)	<ul style="list-style-type: none"> - Lean methods streamlined processes and reduced patient wait times (Lean Methodology, Streamlined Workflow, Reduced Wait Time) - Staff training and visual tools improved process adherence (Staff Training, Visual Management) - Study noted sustained improvement with continuous feedback loops (Continuous Improvement, Sustainability) 	<ul style="list-style-type: none"> - Lean Methodology - Streamlined Workflow - Reduced Wait Time - Staff Training - Visual Management - Continuous Improvement - Sustainability
Singh, P., & Chang, S. (2022)	<ul style="list-style-type: none"> -AI monitors patient flow in real time (AI monitoring) -Predictive analytics aid resource use (Predictive Analytics) - Alerts help manage bottlenecks (Proactive Management) - Supports data-driven decisions (Data-Driven Decisions) 	<ul style="list-style-type: none"> - AI monitoring - Predictive Analytics - Proactive Management - Data- Driven Decisions

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
Turner, L., & Evans, D. (2021)	<ul style="list-style-type: none"> - Redesigning care pathways improved patient flow and reduced delays (Care Pathway Redesign, Patient Flow, Delay Reduction) - Use of triage enhancements helped prioritize care effectively (Triage Optimization, Prioritization) - Staff collaboration was critical to implementation success (Staff Collaboration, Process Alignment) 	<ul style="list-style-type: none"> -Lean Six Sigma - Reduced Wait Time - Streamlined Workflow - Staff Involvement - Change Management - Process Improvement - Quality Monitoring
Watson, J., & Garcia, D. (2020)	<ul style="list-style-type: none"> -Lean Six Sigma led to reduced patient wait times and streamlined operations (Lean Six Sigma, Reduced Wait Time, Streamlined Workflow) - Staff participation was key to successful implementation (Staff Involvement, Change Management) - Continuous improvement processes were emphasized (Process Improvement, Quality Monitoring) 	<ul style="list-style-type: none"> -Lean Six Sigma - Reduced Wait Time - Streamlined Workflow - Staff Involvement - Change Management - Process Improvement - Quality Monitoring
Wilson, D., & Palmer, T. D. (2020)	<ul style="list-style-type: none"> - Technology, including electronic health records and digital check-ins, streamlined patient processing and reduced wait times (Technology Integration, Digital Check-in, EHR, Wait Time Reduction). - Challenges included user training and system interoperability (User Training, System Interoperability) 	<ul style="list-style-type: none"> - Technology Integration - Digital Check-in - EHR - Wait Time Reduction - User Training - System Interoperability
Zhang, L., & Tang, H. (2021)	<ul style="list-style-type: none"> - Use of predictive analytics led to more accurate demand forecasting (Predictive Analytics, Demand Forecasting) - Wait times reduced through real-time data monitoring (Real-Time Monitoring, Reduced Wait Time) - Decision-making improved with dashboard visualizations (Data-Driven Decisions, Dashboard Tools) 	<ul style="list-style-type: none"> - Predictive Analytics - Demand Forecasting - Real-Time Monitoring - Reduced Wait Time - Data-Driven Decisions - Dashboard Tools

Appendix E: Final Concept/Thematic Map

