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Walden University

College of Management and Human Potential

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Victoria Frink

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Improving the Efficiency of Interhospital Transfers Through Best Practices of Care

by

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Abstract

The variability within interhospital transfers represents challenges for hospitals to maintain a standardized level of care for patients. This integrative review explored evidence-based healthcare interhospital transfer practices to improve outcomes and efficiency of care for patients. Under the framework of the Donabedian model of health quality, the study examined 28 empirical and nonempirical articles published from 2021–2025 for best practices to provide improvement measures towards care for transfer patients and increase support for healthcare personnel. These articles were analyzed for quality using the Johns Hopkins evidence-based practice model. Through analysis, seven themes were identified: improving interhospital communication, improving time-based care, increasing positive health outcomes, prioritizing resource utilization, improving transfer decision making, improving management of care expectations, and standardizing transfer protocols. Subthemes identified include prioritizing criteria for verbal/written communication, improving readmittance rates, improving 30-day outcomes, improving patient/bed management, dynamic scheduling, enhancing patient eligibility criteria, optimizing organization of transfer care plans, and prioritizing transfer safety guidelines. Recommendations for professional practice are offered with a foundation in evidence-based interventions for improvements in interhospital transfers. Through these recommendations, interventions may lead to positive social changes like earlier access to clinical information, improving resource utilization rates, lowering risks of in-hospital mortality and complications, and improving operational efficiency.

Part 1: Practice-Based Problem

Problem of Interest

Interhospital transfers are often utilized to ensure that time-dependent, complex medical cases receive specialized support or higher levels of healthcare services (Yu et al., 2022). Despite the common usage of interhospital transfers, these processes are subject to several vulnerabilities that can inhibit the quality of care experienced by patients. Across the healthcare industry, service organizations like hospitals have experienced significant challenges relating to interhospital transfers due to a lack of standardization protocols. These industry-side challenges include deficiencies within communication of referring and admitting hospitals, delays in treatment, and lowered prognosis outcomes for patients (Taghlabi et al., 2024).

With these delays in treatment, hospitals involved in the transfer process note higher rates of resource utilization (Jaan et al., 2025). Literature shows that these delays in care are also associated with higher rates of complications and in-hospital mortality (Chen & Wen, 2023). Without standardized communication protocols, many facilities experience a lack in giving and receiving critical patient information during transfers. This lack of information may lead to increased delays of necessary interventions, which could negatively impact the prognosis outcome for interhospital transfer patients (Alagoz et al., 2023).

By performing a closer examination on these operational deficiencies and their impact on interhospital transfers, healthcare administrators can help to implement strategies of best practice to help reduce risks of adverse outcomes. Such practices can take place in both referring and admitting hospitals to address these challenges. Potential

implications for positive social change involve increasing earlier access to clinical information for admitting hospitals, lowering resource utilization rates, lowering risks of in-hospital mortality and complications, and improving the operational efficiency in hospitals involved within the transfer process.

Healthcare Administration Problem

Background

Interhospital transfers are often considered a needed requirement for some patients to ensure favorable prognosis outcomes. Most of these patients are those considered medically complex and often require specialized treatments and technology options with the necessary trained staff that their referring hospital may not have. With an aging population, the United States is experiencing higher rates of interhospital transfers (Fernandes-Taylor et al., 2021).

As a result, hospitals involved in the transfer process may experience higher resource utilization and limited capacity to care for a growing number of patients needing specialized care (Baig et al., 2022). There is no formal, standardized process for interhospital transfers that addresses the eligibility criteria for patients to be considered for transfer or the timeliness of sharing clinical information between referring and admitting hospitals. With no standardized protocols currently in place, inconsistencies may become more prevalent within hospital operations, which may result in worse outcomes for transfer patients (Fernandes-Taylor et al., 2021).

Operational Problem

Within the United States, approximately 1.6 million patients are affected by interhospital transfers each year (Reimer et al., 2023). Within that amount, 3.5%

represents in-hospital admissions (Yu et al., 2022). Despite such high transfer occurrences that are shown to be increasing each year, no national guidelines or protocols exist at this time that address assessments of care and clinical processes between referring and admitting hospitals.

Due to this, hospitals often generate their own protocols for such transfers, but without standardization of procedures, inconsistencies can take place that may lead to adverse patient outcomes (Fernandes-Taylor et al., 2022). Major adverse outcomes are higher risks of in-hospital mortality, increased risk of illnesses, longer lengths of stay, and higher resource utilization (Yu et al., 2024). This was exemplified in a study by Fernandes-Taylor et al. (2022), which found that out of 118 hospitals that transferred over 3,000 patients over a 2-year span, 1,131 patients experienced extended length of stay, mortality, or in-hospital morbidity.

Within another study by Emanuelson et al. (2022), researchers examined interhospital transfers amongst emergency general surgery patients. It was found that emergency general surgery interhospital transfer patients had higher rates of in-hospital mortality, ranging from 2.3% to 7.5% increase in occurrence compared to patients who were not transferred. For providers and nursing staff, interhospital transfers bring another layer of unique challenges. In a study conducted by Yu et al. (2024), researchers found that many clinicians in accepting hospitals felt that incoming information about patients was often inaccurate or even missing. This often led to feelings of uncertainty about what to expect during patient arrivals, or how to go about giving the appropriate treatment when critical information was missing (Mueller et al., 2021).

Because the accepting provider who negotiates transfers by phone may not necessarily be the admitting provider, initiating care plans and sharing those with the nursing staff becomes difficult. Nurses can often feel that they are not providing the best quality of care because it can be difficult to truly assess the patient's needs and acuity without prior knowledge during patient handoffs (Yu et al., 2022). The variability in outcomes from the moment transfer patients are accepted to the moment they receive care can provide insight into the operational deficiencies currently present that impact providers, nurses, and patients.

Desired State of Operations

Literature suggests that increasing communication between referring and admitting hospitals during interhospital transfers can provide more favorable outcomes and more preparedness amongst providers and nurses. Such communication can be in the form of creating standardized protocols for transfers that can be used across hospitals to help in more efficient handoffs (Fernandes-Taylor et al., 2022; Walters et al., 2023; Yu et al., 2022). Other improvements can include timely clinical evaluations of patients and the transfer of that information to the nursing staff (Yu et al., 2022).

Increasing this communication and being aware of patient conditions before their arrival may allow admitting hospital medical personnel to actively monitor patient arrival and ensure that their own assessments take place to develop necessary care plans (Yu et al., 2024). This may not only improve the consistency and timeliness of care, but also lead to reductions in delays in care, which can improve risks of in-hospital mortality and illness (Fernandes-Taylor et al., 2022).

In a retrospective study by Ludwig et al. (2024), acute respiratory failure (ARF) patients undergoing interhospital transfers were examined. Researchers found that of the 1,269 transfers within Florida's Healthcare Cost and Utilization Project (HCUP) database, ARF patients waited an average of 4 days before their transfer took place. Researchers found through their analysis that longer lengths of stay were associated independently with increased mortality.

Other research in this study, utilizing data from an academic center, was able to show, with 95% confidence intervals, that measures of increased mortality had an OR index of 1.029. This indicates that ARF patients are at increased risk of mortality through interhospital transfers (Ludwig et al., 2024). By improving the timeliness of clinical assessments and establishing clear care plans, resource utilization (length of stay) may decrease, and patients may be able to receive quality care more efficiently with less risk of adverse outcomes. Please refer to Appendix A for a detailed description of the literature review results that support this healthcare administration problem.

Professional Practice Gap Statement

Interhospital transfers currently account for 1.5% of all patients presenting to the hospital within the United States, and this figure is currently growing (Mueller et al., 2024). For patients within the intensive care unit (ICU), approximately 4.5% of this population will experience interhospital transfers, converting to approximately 50,000 transfers each year within the United States (Baig et al., 2022). Due to a lack of standardization, interhospital transfers can pose a risk to patient safety and negatively affect the quality of the care patients receive (Jaan et al., 2025). Communication

deficiencies were shown to cause harm to surgical transfer patients, with approximately 43% occurring during the handoff stage (Fernandes-Taylor et al., 2024).

Through the implementation of efficient standardized protocols between referring and admitting hospitals, healthcare administrators and providers may be able to help increase advanced communication of impending interhospital transfers to receiving hospitals, lower delays in triage care, and increase the timeliness of needed subspecialty care (Leven et al., 2022). Evidence suggests that improvements in communication between referring and admitting hospitals may prevent up to 70% of adverse health outcomes from occurring during the transport of critically ill patients (Alagoz et al., 2022) This study will examine methods of best practice for healthcare administrators to help increase operational efficiency and safety during interhospital transfers.

Summary of Evidence

Inconsistencies in operational processes for the care of interhospital patients can create vulnerabilities that express themselves within mortality rates, risks of complications, resource utilization, and delays in care (Taghlabi et al., 2024). The roles of providers, nurses, healthcare administrators, and other healthcare personnel between referring and admitting hospitals are often highlighted as factors for concern that lead to such outcomes. No standardizations in communication between hospitals, lapses in patient assessments, and lack of established care plans can create environments of stress and uncertainty, with patients often suffering in the process (Mueller et al., 2021).

Yu et al. (2022) conducted a study on nursing perspectives during interhospital transfers. Researchers found within their three focus groups of 21 nurses that a lack of standardization within transfers caused feelings of stress and difficulty in preparing and

anticipating the needs of transfer patients. Nurses also felt that they could not fully provide quality treatment due to the lack of, or limited, information on patients before their arrival to the hospital. Other studies suggest that standardization of interhospital transfers can help to reverse many of the poor outcomes observed, as it reduces inconsistencies and establishes clear guidelines to follow to help in creating a more efficient transfer process (Leven et al., 2022).

The Donabedian model of healthcare quality may help healthcare administrators within the creation of a standardization process for interhospital transfers. By closely examining current practices of care within their respective hospitals and identifying indicators that lead to potential negative outcomes, healthcare administrators may be able to utilize this information to implement best practices to aid in efficiency (Tossaint-Schoenmakers et al., 2021).

Purpose of the Integrative Review

The purpose of this integrative review is to provide hospitals and healthcare administrators with creative strategies of best practice to help improve the operational efficiency of interhospital transfers while simultaneously decreasing poor prognosis risks for patients. Literature connects interhospital transfers with higher risks of in-hospital mortality, increased occurrences of complications, and a rising rate of resource utilization (Sakowitz et al., 2023). Thus, it seems interhospital transfers can be a patient's last measure of hope for survival while also putting their safety in jeopardy.

Relating to social determinates of health, this study highlights differences that smaller, often rural, hospitals face when compared with their larger, urban counterparts. With many rural hospitals closing and others consolidating into various health systems,

interhospital transfers are becoming a fast-rising solution to complex care needs (Reimer et al., 2023). Within the rural hospitals that are within operation, the staff, equipment, and various resources needed to provide higher levels of care needed by some patients are often not present (Reimer et al., 2023).

The negative environmental and economic factors some patients incur can impact their care outcomes with interhospital transfers. By improving the operations and developing a standardized system to improve efficiency, patients may receive timely, specialized care. For hospitals, standardization of operations may positively impact resource utilization, lower in-hospital mortality rates, and improve patient outcomes.

Integrative Review Question

RQ: What best practices can hospitals utilize to improve the care of patients, support hospital processes, and encourage creative solutions during interhospital transfers?

The goal of this integrative review was to identify key components of successful interhospital transfers, identify potential operational barriers that lead to adverse outcomes, provide solutions to enhance timely quality care, and provide suggestions to improve communication between referring and admitting hospitals. Lack of standardization protocols within interhospital transfers leads to gaps in understanding. This integrative review seeks to help close those gaps, while also providing healthcare administrators with creative, best practices to optimize operational efficiency and care for patients.

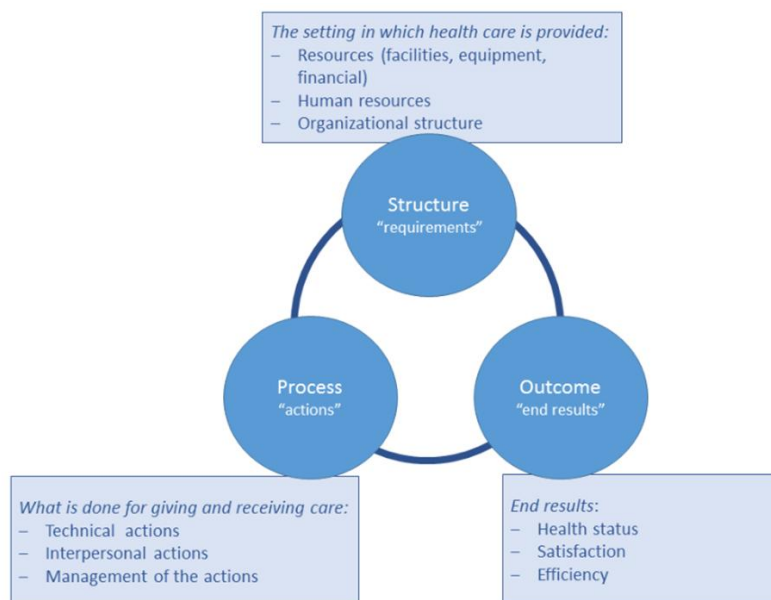
Conceptual Framework

The Donabedian model of healthcare quality was originally designed to assess the connections that exist amongst the performances of health providers, the responsibility of how healthcare is defined, and how society often helps to define individual preferences of the care that is sought (Donabedian, 1988). This model has a three-component approach to addressing and evaluating quality of care to develop methods of improvement. These components include structure measures, process measures, and outcomes measures (Tossaint-Schoenmakers et al., 2021). This framework's foundation lies in understanding that the overarching structure of a health system has specific requirements needed to create and process appropriate healthcare. The way that these processes are completed determines the outcome/quality of care that patients receive.

This integrative review explored examining interhospital transfers through a structural lens. With this method, I was able to identify key factors within its process and the resulting outcomes to determine best practices for improving safety and quality of care that patients receive. Through utilizing the Donabedian model, healthcare administrators may be able to examine how interhospital transfers as a structure can be best addressed within their respective health organizations to then implement best practices to improve. Figure 1 shows the Donabedian model of healthcare quality.

Figure 1

Diagram Illustrating the Donabedian Model of Quality Healthcare



Note. From “The Challenge of Integrating eHealth Into Health Care: Systematic Literature Review of the Donabedian Model of Structure, Process, and Outcome,” by R. Tossaint-Schoenmakers, A. Versluis, N. Chavannes, E. Talboom-Camp, and M. Kasteleyn, 2021, *Journal of Medical Internet Research*, 23(5), Article e27180. Copyright 2021 by R. Tossaint-Schoenmakers, A. Versluis, N. Chavannes, E. Talboom-Camp, and M. Kasteleyn.

By understanding the flow from structure to outcome, the Donabedian model can be valuable to healthcare organizations seeking to improve their operational efficiency and the quality of care their patients receive via interhospital transfers. With no standardized protocol that exists for interhospital transfers, healthcare providers, staff, and administrators may notice vast differences in the type of requirements their organization has, how their organization responds to information to determine the best actions (process) to provide care, and ultimately what that care looks like for the patient (Leven et al., 2022). This model may help to provide a streamlined method of examining organizational vulnerabilities and may be the gateway for improving efficiency and care.

Part 2: Literature Review, Quality Appraisal, and Analysis

Literature Search Strategy

An integrative review of literature published between 2021 and 2025 was conducted. The databases utilized included PubMed, Sage Journals, American Public Health Publications (APHA), JSTOR, and the Journal for Healthcare Quality (JHQ). Within Google Scholar, the key search words included *interhospital transfer*, *transfer efficiency*, *resource utilization*, *patient safety*, *interhospital transfer communication*, and *interhospital delays*. Keywords were utilized across all databases. Both inclusion and exclusion criteria are provided in Table 1.

The target population was hospitals, specifically relating to the network involved within interhospital transfers. These include both referring and admitting facilities. The inclusion of the unique perspectives of interhospital transfers on those directly affects, such as patients, nurses, physicians, and administrators, was also necessary.

Table 1

Inclusion and Exclusion Search Criteria

Inclusion search criteria	Exclusion search criteria
<ul style="list-style-type: none"> • 2021–2025 • Interhospital • English language • Patient safety • Transfer efficiency • Resource utilization • Delays in care • Effective communication 	<ul style="list-style-type: none"> • Prior to 2021 • Intrahospital

Quality Appraisal

Most of the literature highlighted deficiencies within the interhospital transfer process, the effects on resource utilization, and the impacts on patient safety and medical personnel. A broad range of inclusion criteria was utilized to encompass areas that could have a relation to the efficiency of interhospital transfers. Aside from interhospital transfers, the inclusion of the perspectives of healthcare personnel such as nurses, physicians, and administrators was valuable as they provided unique perspectives that highlighted improvement opportunities. Articles were utilized if they addressed either the efficiencies or drawbacks of interhospital transfer, as well as the unique perspectives of the patients and medical personnel involved in the process.

Results of this literature search produced 63 articles that were applicable for the review process. Articles were screened by title and abstract based on the relationship and relevance to the review question and the inclusion criteria. After full-text reviews, 29 articles were excluded due to insufficient emphasis on the effects of interhospital transfers or its association with patient safety; focusing on a case study with not much relevance to the interhospital transfer process; and not having the perspectives of medical personnel and patients. Six were excluded due to redundancy. See Appendix B: Review Question(s) Search Log for information on search results.

A total of 28 articles were included for analysis. All articles were appraised using the Johns Hopkins Nursing Evidence-Based Practice Model (JHNEBP). Of the 28 articles that were chosen for review, 17 were able to be appraised as high quality, and 11 were appraised as good quality. These articles produced concise results and conclusions, while

also having strong recommendations for improvement. Further details on the quality appraisal results can be found in Appendix C: Critical Appraisal Results Log.

Thematic Analysis of Literature

A majority of the articles within this review contained a variety of qualitative and quantitative studies to include longitudinal and observational studies. Other studies were regression analyses that took place within cohorts that were comparative in nature, while some studies involved data gathered using interviews, surveys, and email questionnaires. Through the results of these studies, deficiencies within the interhospital transfer process were able to be identified, along with the perspectives of patients, nursing staff, and physicians for both admitting and receiving hospitals.

Limitations within these studies were also able to be accessed and provided opportunities for growth, quality improvement, and patient safety. A few of the limitations that were highlighted within the studies included those that only took place at a single facility, having a lower than desired response rate on surveys and questionnaires, and smaller sample sizes that possibly impeded on the ability of the study to be generalizable (Alagoz et al., 2022; Yu et al., 2022; Yu et al., 2024).

The development of the themes and subthemes was completed through the identification of frequently used terms to highlight best practices for interhospital transfers. A thematic analysis conducted on the 28 included articles produced seven major themes, along with eight subthemes. Codes were then extracted from the findings within the 28 studies and categorized based on their alignment with the Donabedian model of healthcare quality. These themes and subthemes can be found in Table 2.

Table 2*Themes and Subthemes*

Main theme	Subtheme
Improving interhospital communication	Enhancing EHR data transfer
Improving time-based care	Prioritizing criteria for verbal/written communication
Increasing positive health outcomes	Increasing postoperative monitoring
Prioritizing resource utilization	Improving patient/bed management Dynamic scheduling
Improving transfer decision making	Enhancing patient eligibility criteria
Improving management of care expectations	Optimizing organization of transfer care plans
Standardizing transfer protocols	Prioritizing transfer safety guidelines

Part 3: Presentation of Results

Addressing the integrative review question, “What best practices can hospitals utilize to improve the care of patients, support hospital processes, and encourage creative solutions during interhospital transfers?” Several core elements were able to be identified through data analysis to better understand the interhospital transfer process and how certain elements within the management of that process are related. Researching best practices for the improvement of interhospital transfers has the potential to identify strategies that will bring solutions to hospitals and improve the care of patients. Initial codes were able to be identified and grouped according to themes that aligned with the Donabedian healthcare model. Of the 28 studies that were analyzed in this review, there were 7 core themes, along with 8 subthemes. The interconnecting themes and subthemes shown are identified through both the thematic analysis results and the thematic concepts map (See Appendices D and E).

Theme 1: Improving Interhospital Communication

The theme of communication consists of factors relating to the experience of patients and healthcare staff involving shared clinical information between referring and admitting hospitals. This can be further analyzed to encompass the unpredictable nature that interhospital transfers present for healthcare personnel within the admitting institution. Interhospital transfers are historically associated with a lack of consistently shared clinical information and an overall disorganization amongst physicians and nurses who initiate the transfer process, which can impact the care patients receive once admitted (Mueller et al., 2021). Improving the level of communication between hospitals is a key factor in creating a more trusting workplace culture amongst providers and

nurses, while also ensuring timeliness of care for patients once they are transferred to the admitting hospital.

Subthemes

- *Enhancing EHR data transfer*—Connecting healthcare service providers with pertinent clinical information from referring and admitting hospitals provides a clearer clinical profile of incoming patients, helping providers to more readily develop treatment plans. Through the introduction of shared EHR networks or other interoperable platforms for ease of communication can lead to earlier notification of clinical data and status of patients for interhospital transfers (Bergmark et al., 2023; Reimer et al., 2023; Young et al., 2022)

Theme 2: Improving Time-Based Care

Improving time-based care through enhancing verbal and written communication amongst providers before and during interhospital transfers can help reduce delays in care and provide optimal patient care, even with the unpredictable nature of interhospital transfers. By establishing protocols and addressing gaps in logistical matters such as the clarity and method of communication received, timely care plans can be conceived for patients. (Bergmark et al., 2023; Young et al., 2022)

Subthemes

- *Verbal vs. written communication*—Healthcare professionals have expressed desires for increased written communication relating to incoming transfers regarding their status and timeline of transfer for necessary preparation. Verbal communication was also found to be necessary in the handoff stage of interhospital transfer. The relaying of necessary information during the

handoff of referring and accepting physicians could help in clarifying patient information and expedite the creation of individualized care plans (Garabedian et al., 2025).

Theme 3: Increasing Positive Health Outcomes

Positive health outcomes after procedures for transfer patients have been shown to be correlated with a variety of factors, such as the level of clinical information shared before transfer, the timeliness of care once the patient arrives at the admitting hospital, in addition to any additional interventions that may be needed upon provider evaluation. Using metrics such as arrival time, timeliness of care, and readmittance rates, can help to improve rates of positive outcomes, such as decreasing the rates of infections and in-hospital mortality within hospitals (Baig et al., 2022).

Subthemes

- *Increasing postoperative monitoring*—Postoperative monitoring of transfer patients, especially those with conditions deemed to be “major” such as cardiac arrest or stroke, have shown to be of benefit in decreasing rates of postoperative complications and in-hospital mortality. Through increased communication amongst referring and admitting facilities, clinical details such as degree of injury along with any present deficits can help streamline the care pathway for patients. These factors were shown to help lower resource utilization, lower readmittance rates, and improve rates of 30-day positive outcomes for transfer patients (Taghlabi et al., 2024).

Theme 4: Prioritizing Resource Utilization

Resource utilization refers to the usage of resources by hospitals for patients who are transferred from one hospital to another. This can be in the form of bed space management and the increased usage of materials and services needed during the transfer process. Metrics for resource utilization can be used to help hospital administrators and healthcare personnel have a profile of their individual hospitals in terms of efficiencies of services (Yu et al., 2024).

Subthemes

- *Improving bed/patient management*—Increasing advanced notification of transfers, especially during heightened times of patient flow within hospitals, can help to allocate necessary resources such as bed space for incoming transfers. This will improve rates of continuity of care, with resources being more readily available during the timing of transfer (Mueller et al., 2021).
- *Dynamic scheduling*—Healthcare personnel can be better prepared for incoming interhospital transfers with advanced notification of adequate clinical information of the patients. This helps determine roles and responsibilities in the creation of care plans and can help improve staffing efficiency as well as feelings of professional satisfaction (Yu et al., 2022).

Theme 5: Improving Transfer Decision Making

The theme of decision making refers to the process accepting physicians undergo to determine whether a proposed transfer patient will be accepted. Certain challenges such as untimely or incomplete clinical information provided, or an inability to perform personal evaluations before developing potential care plans, can cause unease and doubts

within the decision-making process for a patient's provider and care team. These challenges can be overcome by adequate, timely sharing of standardized clinical information before transfer takes place. This can help providers determine patient eligibility for transfer as well as potential plans of action when assigning treatment plans (Yu et al., 2024).

Subthemes

- *Enhancing patient eligibility criteria*—Enhancing the level of clinical information shared can help to improve overall communication between transferring and accepting providers, help to optimize care continuity, and can aid in the decision-making process for providers to determine acuity level and whether patient transfer would be necessary or beneficial. (Yu et al., 2024).

Theme 6: Improving Management of Care Expectations

The theme of improving management of care expectations refers to openness of shared care plans between the admitting care team and the incoming transfer patients. This can be related to the timeliness of the transfer, the timeliness of the initiation of care, or even procedural changes and decisions that take place once in-person evaluations are completed.

Subthemes

- *Optimizing organization of transfer care plans*—Prioritizing pre-establishing care plans and acuity levels before patient arrival can help patient care continue seamlessly once transfer takes place and improve confidence in the transfer process for providers and nurses. Optimizing care plan organization can also provide patients with more realistic expectations for treatments and

more clarity if certain procedures change or are deemed unnecessary by admitting providers, by having those changes communicated in a timely manner (Yu et al., 2024).

Theme 7: Standardizing Transfer Protocols

The theme of standardization refers to the protocol measures that, once implemented, may show improvements in the sharing of clinical information amongst referring and accepting hospitals, enhance patient safety during the transfer process, and improve positive health outcomes for the patient during and after transfer (Alagoz et al., 2022).

Subthemes

- *Prioritizing transfer safety guidelines*—By creating clear guidelines for interhospital transfers, healthcare personnel will have the opportunity to use clinical information on the patient from referring hospitals to guide patient safety practices. Nurses will be able to identify risks and other complications earlier and help to stabilize patients to ensure safe arrival and timely continuity of care. (Alagoz et al., 2022; Almqvist et al., 2023).

Interpretation of the Findings

Theme 1: Improving Interhospital Communication

Ensuring patient safety during interhospital transfers relies heavily on adequate communication amongst referring and admitting hospitals, as well as throughout the care team assigned to the patient (Alagoz et al., 2022). Enhancements within communication have been shown to heighten instances of positive patient outcomes and overall safety. Through examining factors such as the triage process and the coordinating calls that

oversee interhospital transfers, improvements can be made to provide a more complete clinical profile of patients, along with including necessary additions like images and any exam findings. These factors can lead to safer patient transfer practices and increase positive patient outcomes.

Subtheme: Enhancing EHR Data Transfer

Efficient communication and the sharing of patient information can lead to more positive patient outcomes with interhospital transfers (Alagoz et al., 2023). The use of differing electronic health record services can interfere in the ability to appropriately gain a clear clinical profile of incoming transfer patients (Emanuelson, et al., 2022). Helping to develop a more streamlined approach that provides ease in the communication of patient data could aid in both the timeliness of decision-making on patient eligibility and how soon transfer occurs (Emanuelson, et al., 2022).

Theme 2: Improving Time-Based Care

Time-based care can be a multi-faceted occurrence within interhospital transfers. Many instances may be found due to the actual timing of transfers. Through the improvement of communication, advanced notification of the timing of transfers can be more easily identified for accepting physicians. This can help to reduce feelings of frustration for providers and can aid in the creation of treatment plans due to having a more prepared staff, improving timeliness of patient care (Yu et al., 2024). This can have a direct positive impact on nurses by decreasing feelings of unpreparedness on the accepting healthcare team (Mueller et al., 2024).

Subtheme: Prioritizing Criteria for Verbal/Written Communication

Creating a streamlined process for the delivery of clinical information during interhospital transfers can lead to a reduction in discrepancies regarding the quality of information shared from referring hospitals (Alagoz et al., 2023). Accepting residents have been found to prefer direct conversation with the transferring physician to obtain more in-depth clinical information and reduce instances of unnecessary transfers (Mueller et al., 2024). Other providers prefer more detailed write-ups of incoming transfers, and with a standardized procedure for shared information, the level of detail shared within the triage and transfer process amongst hospitals can become more consistent (Downer et al., 2023).

Theme 3: Increasing Positive Health Outcome

Literature suggests there is a correlation between interhospital transfers and longer hospital stays. Approximately 4.5% of intensive care unit (ICU) admissions are from interhospital transfers (Baig et al., 2022). Patients with higher complexities and illness severity are more likely to experience interhospital transfers and often have their own barriers to care that, if not addressed, can reduce chances of positive health outcomes (Baig et al., 2022).

To combat these barriers and produce more positive patient outcomes, improvements within the preparation and proper patient handoff protocols from referring and admitting hospitals can be made. It's imperative that education and training on the various presentations nurses may be faced with during interhospital transfers be prioritized to increase positive patient outcomes and mitigate risks (Downer et al., 2023). In addition to this, having protected preparation time was also shown as a key

intervention factor in improving nurse confidence and patient safety during transfer.

Protected preparation time can also lead to room for growing guidance in how to manage various patients who present with differing degrees of symptoms and complications, and lead to an improvement within risk assessment (Downer et al., 2023).

Subtheme: Increasing Postoperative Monitoring

The incorporation of postoperative monitoring is imperative after patient discharge and during the 30 days after to help identify potential risks of complications and treat them appropriately within a timely manner. Interhospital transfer patients are often more likely to have at least one comorbidity present, along with greater need for operative/surgical interventions, so postoperative monitoring can identify potential instances of patient decline (Taghlabi et al., 2023). Other measures to help with postoperative monitoring is the increased use of telehealth visitations, where vital signs and other medical information can be obtained by providers to help identify potential complications and provide prompt intervention strategies when needed. The use of telehealth can also reduce unnecessary exposure to potential hospital infections. Together, these factors can help to reduce current mortality rates that range from 2.3% - 12.6% for interhospital transfer patients for those that require emergency general surgery (Emanuelson et al., 2022).

Theme 4: Prioritizing Resource Utilization

Timeliness of care can be an indicator of operational efficiency and can often directly relate to resource utilization. Improving these metrics can reduce unnecessary high rates of resource utilization found within length of stay (LOS) and bed space (Chen and Wen, 2023). In the cases of unforeseen transfers, having adequate interhospital

communication and handoff protocols can also be used to reduce higher resource utilization. Increasing communication can also lead to improvements in handoff procedures, which reduces the occurrences of duplications of certain testing procedures, imaging, and other treatments (Chen & Wen, 2023).

Subtheme: Improving Patient/Bed Management

Improving the efficiency in hospital bed management is a key factor in improving timeliness of care, which can also show improvements in the lengths of stay of patients, and improve bed space management within hospitals (Nadig et al., 2022; Stamm et al., 2023). This can especially be helpful within emergency departments, where the decision-making process for medically complex patients to be determined is frequent.

Overcrowding can often be a determining factor for transfer due to a lack of readily available resources. With proper bed management and effective use of resources, hospitals will be able to more readily identify influxes of patients and make pre-emptive decisions on care to avoid adverse outcomes for patients.

Subtheme: Dynamic Scheduling

Members of the care team that are ready to accept incoming transfer patients are critical in helping to ensure patients have the best chances of a favorable outcome. With increased consistency in communication during interhospital transfers, the roles of members of the care team can be known ahead of the time of admittance, which can help to improve the clinical stability of the patient during handoffs (Yu et al., 2022). This can alleviate sources of frustration for nurses and other members of the care team, as they can be provided with care tasks via provider orders at a sooner time. This can lead to more positive patient outcomes (Yu et al., 2022).

Theme 5: Improving Transfer Decision Making

With over 1 in 4 interhospital transfers relating to emergency general surgery deemed potentially avoidable, the decision-making process to determine the appropriateness of transfer is critical (Teng et al., 2021). By increasing the level of clinical information shared before transfers take place, the environment in which these decisions take place can lead to more certainty from providers and reduce occurrences of unnecessary transfers. This can lead to increased trust amongst care teams, as providers can feel more confident in their abilities to make a solid decision on not only the necessity of transfer, but also for the specific treatment plan of the incoming patient, which can be relayed to care teams (Chen & Wen et al., 2023).

Subtheme: Enhancing Patient Eligibility Criteria

The presence of a standardized, closed-loop system where information can readily be sent and received between hospitals involved in the transfer process could potentially alleviate the challenges seen with determining patient eligibility (Mueller et al., 2024). Determining the acuity level of patients is difficult when clinical information is lacking or inadequate. With standardization in the sharing of clinical information, determining the necessity of transfer or determining the staff members that will be delegated to help in the patient's treatment can be done more effectively. Accepting hospitals can also be more readily alerted to clinical status changes of the patients during active transfer that before the patient's arrival, which can be quickly relayed to the care team. (Yu et al., 2024).

Theme 6: Improving Management of Care Expectations

To help ensure a streamlined process with interhospital transfers, it may be beneficial for both patients and their healthcare team to have similar expectations regarding their care and treatment plans. Walters et al. (2023) reports that providers and nursing staff can at times feel there are several competing needs surrounding decisions and care expectations of incoming transfer patients. With proper communication prior and during transfers, patients and staff can be more aware of intervention changes and other treatment necessities once patients arrive at the hospital. This can help patients build more trust within their individualized care plans and towards those that will aid them in their care.

Subtheme: Optimizing Organization of Transfer Care Plans

In research conducted by Yu et al. (2024), healthcare staff responsible for the care plans for incoming transfer patients relayed that patients often expected their care to continue seamlessly after transfer and were often disappointed when changes were made that they may not have been aware of. After evaluations take place at the admitting hospital, some procedures may not be deemed necessary and may often lead to challenging conversations with patients and their families.

Through optimizing the organization of these transfer care plans, staff will have pre-existing knowledge of their roles for an upcoming transfer patient, helping care to continue immediately upon arrival with the necessary clinical knowledge to help the patient's transition. This can help to alleviate the stress for inpatient, floor-level units, as these departments can prepare the appropriate staffing numbers and resources to help patients who may be deteriorating upon arrival (Yu et al., 2024). Expectations of timely

updates on the clinical status of the patient can be met for the accepting healthcare team and can create a more cohesive environment for patients, especially if there are changes to any previous suggested medical interventions (Yu et al., 2024).

Theme 7: Standardizing Transfer Protocols

There has been an increase in the rate of interhospital transfers, which could be attributed to factors such as the need for specialized services and an uneven distribution of surgeons within hospitals (Emanuelson, et al., 2022). Procedures for transfer of trauma patients have standardized pathways and similar standardization protocols can be used for emergency general surgery patients or patients experiencing other complex medical conditions (Emanuelson et al., 2022). With clear standardization plans in place for a multitude of medical complexities, streamlining patient safety and reducing adverse outcomes may become more apparent.

Subtheme: Prioritizing Transfer Safety Guidelines

With standardization protocols in place for interhospital transfers, patient safety becomes prioritized during transfer process, with transfer more likely resulting in positive outcomes. In a study conducted by Downer et al. (2023), it was found that healthcare staff had feelings of anxiety and stress when asked to be involved in a transfer at “the last minute” or if they felt they did not have enough clinical information to ensure the safety of the patient during the transfer. Ensuring there’s enough information to treat patients who may experience a change in clinical status during the transfer process can help to establish and enforce safety guidelines for a more standardized approach to transfers.

Conceptual Framework: Donabedian Model of Healthcare

With the Donabedian model, the quality of healthcare a patient experiences can be evaluated with three components: structure, process, and outcome. Structure refers to the setting that healthcare services are provided. This would refer to both referring to and accepting hospitals during interhospital transfers. Process involves the type of services that are completed while a patient is receiving their care. Outcome refers to the aftermath of the care, often referring to the health status and satisfaction of the patient (Tossaint-Schoenmakers et al., 2021). With proper interventions and standardizations in place, these structures can lead to positive outcomes for patients, with continuity of care being able to happen more swiftly due to properly communicated clinical information to healthcare personnel and patients (Almqvist et al., 2023; Chen & Wen, 2023; Taghlabi et al., 2024). The interconnectedness of these categories can also be connected to the connectedness of the core themes and main themes found amongst the literature.

Core themes of Improving Interhospital Communication, Prioritizing Resource Utilization, and Improving Transfer Decision Making, along with their subthemes were found to connect to the “Structure” element of the Donabedian model. These themes represent core elements that the organization (hospital) needs to provide healthcare. Necessary sharing of clinical information, understanding bed management and resource needs of incoming patients, and making the proper decisions on whether transfer will be necessary and beneficial all must occur to provide the best foundation for proper care management.

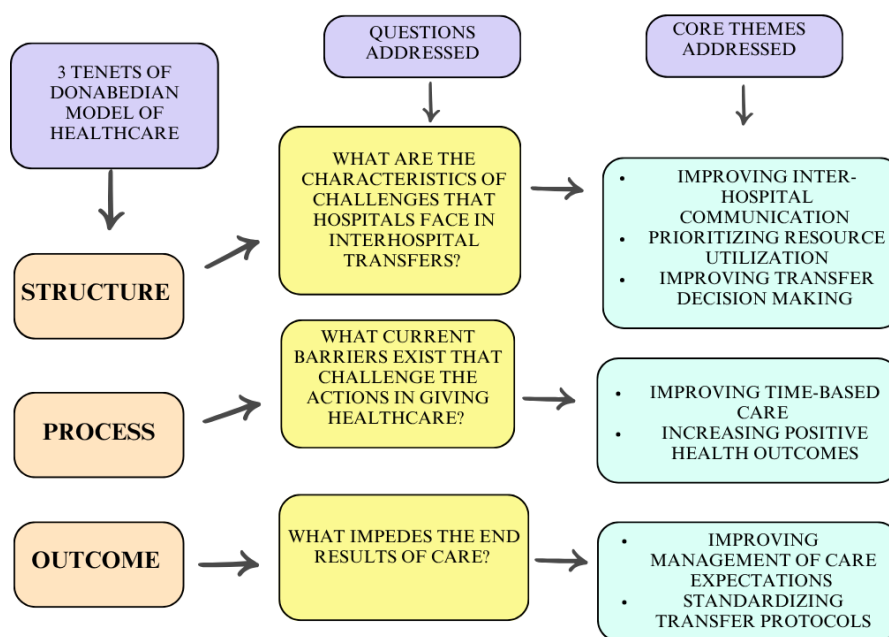
The core themes of Increasing Positive Health Outcomes and Improving Time-Based Care, along with their respective subthemes, can be under the umbrella of the

“Process” section of the Donabedian model. They refer to the actions that take place in the giving and receiving of healthcare. They are occurrences that can take place in hospitals accepting interhospital transfers and can highlight some of the logistical intervention methods necessary to provide adequate care for patients.

Lastly, the themes of Improving Management of Care Expectations and Standardizing Transfer Protocols and their subthemes relate to the “Outcome” portion of the Donabedian model in that they represent the end results of care. Theoretically, positive care expectations and standardization protocols that prioritize patient safety and clinical management procedures are the goal and expectation. These themes can represent a mirror to the current healthcare climate relating to interhospital transfers and highlight areas that could be improved to reach ideal status.

Figure 2

Representation of Donabedian Framework With Thematic Results



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

Recommendations for Professional Practice

The review question for this integrative review was: What best practices can hospitals utilize to improve the care of patients, support hospital processes, and encourage creative solutions during interhospital transfers? This integrative review was able to examine studies of interhospital transfers, along with the existing barriers that impede efficiency. The results found demonstrate the importance of standardization of hospital transfers, patient safety, and improving the communication practices that take place amongst referring and admitting hospitals to better support healthcare personnel. The following is a discussion of recommendations for professional practice to improve hospital and communication protocols in the effort of interhospital transfer effectiveness.

Standardization of Interhospital Transfer Protocols

Interhospital transfers are a key component in helping to ensure patient safety and providing patients with access to necessary diagnostic and therapeutic services that aren't available within their current hospitals (Downer et al., 2023; Lee & Kim, 2022). There are even instances where patients are transferred for reasons other than medical necessity, such as familiarity with certain hospitals or providers (Mueller et al., 2021). With approximately 3.5% of all hospital inpatient admissions being traced to interhospital transfers, this growing category currently has no clear guidelines and is nonstandardized in most of its implementation (Yu et al., 2022). The exception to this involves trauma patients, which has well-defined protocols for transfer via The American College of Surgeons (Emanuelson et al., 2022).

A literature review conducted by Fernandes-Taylor et al. (2021) highlights the importance of standardization within interhospital transfers. With standardization, the transfer decision-making process can take place with lowered risks, creating more positive outcomes on prognosis and patient safety. Downer et al. (2023), surveyed nursing staff and determined intervention methods that could be used to produce more efficient transfers. These involved ensuring enough staff was available for care plan teams, increasing communication on the roles and responsibilities of care team members, and being provided with more clinical information on patients to better support them and positively influence their prognosis of care. To address this gap in services, it is recommended that hospitals involved within interhospital transfers adopt standardized protocols for the safety of patients.

The Donabedian model of healthcare, which breaks down a 3-component approach towards the evaluation of quality-of-care interventions, also supports this recommendation. The tenets of structure, process, and outcomes align with this theme of standardization in that it addresses tools for its implementation, ways to evaluate interventions, and measuring outcomes to determine the ways in which the system has improved. The implementation of standardized protocols for interhospital transfers may lead to improvements in positive patient outcomes and increased uniformity to aid healthcare personnel who will be directly involved with the transfer process, either from the admitting or referring hospital. The following highlights important factors to consider when implementing standardization protocols for interhospital transfers.

Patient Eligibility Criteria

The start to any interhospital transfer process begins with a patient evaluation that determines the need for potential transfer for more advanced services. Over 1 in 4 Emergency General Surgery interhospital transfers are deemed unnecessary and can be potentially avoided (Teng et al., 2021). With set criteria provided within this determination of transferred care, providers' levels of certainty in whether patients are eligible for interhospital transfer can be more readily decided.

In a study conducted by Mueller et al. (2021), it was found that areas of improvement involved communication between referring and accepting physicians regarding the clinical profiles of patients, along with other pertinent information needed to ensure safe transfer. Alagoz et al (2022) also notes that interventions to improve the disconnect with clinical information can improve time-based care and decrease the risks of adverse outcomes. To further assist these efforts in clarifying patient eligibility criteria, the following structures can be implemented.

- Incorporating health information technologists to assist in the development of templates and communication tools that could be utilized to help in the sharing of clinical information for transferred patients. In addition to this, enhancing EHR systems to help with interhospital information exchanges would benefit both referring and accepting hospitals. With a growing concern of interoperability within health information exchange systems, targeting EHR and improving communication platforms can be used to provide advanced notice of patients and their status within the transfer process (Garabedian et al., 2025; Mueller et al., 2021).

- Providing stratification of hospitals based on their provided care services, volume capabilities, and other comprehensive services to aid triage within the transfer process and ensure appropriate hospital locations. This has the potential to support decision-making of transfer needs and can be helpful in improving patient outcomes and keeping resource utilization at adequate levels (Teng et al., 2021).
- Establishing mandatory clinical information regarding patient status, medication list, discharge or interim summary, and other key details that will aid in the decision-making process for whether transfer is necessary. This can be further aided by implementing risk stratification for patients ,including a breakdown of severity levels and conditions that will also help in the decision-making process for triage (Teng et al., 2024; Yu et al., 2024).

Establishment of an Interhospital Transfer Care Plan Team

After the exchange of important clinical information is provided, another key tenet in ensuring the efficiency of interhospital transfer is the establishment of a care plan team before patient arrival. In a study conducted by Yu et al. (2022), the importance of care coordination and organization was analyzed. The variability within the process of interhospital transfers was highlighted, with the perspectives of several nurses being shared that expressed rooms for improvement in feeling more prepared for transfers. This is especially a concern for bedside nurses who, though not directly involved within the transfer decision-making process, often must coordinate between various providers giving care for both transfer patients and others within their assignments (Yu et al., 2022).

Care team assignments can help to prevent lapses in care and improve timeliness of provider orders to be implemented.

The following structure can be implemented to help streamline the process of care plan team formation and help increase feelings of preparedness on those directly involved in the care of transfer patients.

- Establishing a care plan team dedicated to incoming interhospital transfer patients. Before interhospital transfers are fully admitted, bedside nurses and providers will be able to share pertinent information about the patient, have a clear treatment plan and goals outlined, along with ensuring everyone knows their responsibilities. This clinical information would have been shared priorly with enough time to establish a clear plan of action for the patient. This would create both a safer environment for the patient, while also increasing stability and trust amongst nurses and providers (Yu et al., 2022; Yu et al., 2024).

Implementation and Evaluation

By creating a more streamlined process of clinical information sharing, admitting providers will be able to make more confident and timely decisions regarding the transfer of a patient to their hospital. Referring providers will be able to improve their decision-making process on the need for a patient to be transferred by adhering to the stratification of services provided by certain hospitals and ensuring their patients are being referred to a hospital that meets their needs, with the available bed space. This, coupled with an interhospital transfer team already in place who are prepared for transfers with previously assigned responsibilities, may alleviate some of the tension and uneasiness from provider and nurses.

According to the Donabedian model, the tenets of Structure-Process-Outcome are fully achieved given these recommendations and can be utilized in their evaluation. Through the “Structure” tenet, the overall organization of the hospital is examined (Tossaint-Schoenmakers et al., 2021). The barriers to the efficiency of interhospital transfers are identified within this structure, along with any resource/technology requirements, such as the need for enhancements to EHR interoperability and other advancements in the sharing of clinical information between referring and admitting hospitals (Garabedien et al.,2025; Mueller et al., 2021).

The tenet of “Process” refers to process management and how adjustments can take place to improve the overall system, in this case the efficiency of interhospital transfers (Tossaint-Schoenmakers et al., 2021). This is addressed through the creation of interhospital transfer teams, with specific roles and responsibilities pre-established in the case of incoming transfers. This will help to streamline the transfer process and may aid the patients in resuming care at the admitting hospital more quickly than they have previously.

For the tenet of “Outcome”, the results of the recommendations can be interpreted, and any adjustments can be made to better adhere to the overall efficiency of the transfer process (Tossaint-Schoenmakers et al., 2021). Interdisciplinary teams can discuss the progress of patient wait times, the necessity to repeat certain clinical evaluations and labs, bed space management and the effects on overall resource management and examine patient and staff expectations and satisfaction to evaluate the progress of the implementations and make necessary suggestions.

Implications for Social Change

The themes and subthemes that were highlighted within the parameters of the integrative review can be used to improve the process of interhospital transfers, helping to improve social change, and creating a more stable and efficient workplace for healthcare administrators and personnel within the scope of the transfer process. Having a more stable workplace can help to strengthen team culture and increase trust between providers, nurses and other healthcare personnel treating admitting transfer patients. Increasing communication efforts and standardizing the information shared amongst hospitals involved in the interhospital transfer process may lead to improved timeliness and quality of care for patients. This may simultaneously help to reduce resource utilization rates due to faster initiation of care plans and necessary medical interventions.

Strengthened Interhospital Transfer Team Culture

Enhancements in communication between referring and accepting providers and hospitals can improve trust from patients, expedite decision-making, and improve organization within care teams (Alagoz et al., 2022). Effective EHR management, in addition to enhancing the clinical information shared before interhospital transfer takes place will help to build trust amongst patients involved in the transfer process, as well as the healthcare staff within the admitting hospital (Yu et al., 2024). Building trust can lead to an easier transition of care for patients, as well as improving the engagement and confidence of providers and nurses implementing the plans of action for best practices of care (Walters et al., 2023).

Improved Clinical Outcomes for Patients

A key benefit to improving the efficiency of interhospital transfers is the potential positive clinical outcomes patients will experience. The variability within interhospital transfers can be a contributing factor within its higher rates of developing illnesses, experiencing complications, and even mortality for patients (Fernandes-Taylor et al., 2021). Standardization can thus lead to a decrease in the adverse outcomes experienced by patients, through care eligibility assessments, care plan considerations, and overall improved patient profile information for nurses and providers to reference (Alagoz et al., 2022; Fernandes-Taylor et al., 2021). This can further lead to an efficient use of human capital, while also improving the trust from patients expecting to receive a certain service of care within a timely manner (Yu et al., 2022).

Improvements in Resource Utilization

Factors such as length of stay and resource utilization are often referenced when referring to the inadequacies of interhospital transfer. The prediction of the length of stay and resource utilization is often difficult to do, as it is intertwined with several factors involving patient eligibility, bed space management, clinical information provided, care plan construction, and a host of other components (Lee & Kim, 2022). Improving standardization will improve resource utilization, as the needs of the patient will be better communicated, allowing providers to provide efficient courses of action to best care for patients, and providing them with timely services with a team that is aware and confident in the ability to care for those patients (Mueller et al., 2021). These interventions may also help to improve the economic stability of the hospital by lowering unnecessary costs related towards higher resource utilization (Baig et al., 2022).

Limitations

Limitations to this study included the generalizability of the available literature. Several studies took place at one facility, or perhaps a specific geographic region. This causes the ability of such studies to not be as generalized as others who take place across multiple hospitals. An additional limitation involves the retroactive nature of several literature sources. Given the context and nature of interhospital transfers, many evaluations and suggestions for positive changes are only able to take place after reflections and months to years of evaluation of interventions for a specific facility. Retroactive studies may be plagued with missing or outdated data sources and can hinder studies from being replicated.

Conclusion

Even with its challenges, interhospital transfer has shown to be a necessary intervention for many patients, with the benefits often outweighing the risks. Such benefits include a higher chance of patient survival in a hospital that has the skills and equipment to provide complex procedures. Inspiration behind this integrative review was the realization of the strain on economic stability, human capital, resource utilization, and the heightened level of variability that existed with interhospital transfers. This factor, along with interhospital transfers having vastly less literature compared to intrahospital transfers even with it becoming a fast-growing component of transfers, was also a finding that added to the desire to provide more research and solutions for best practices of care.

Seven core themes were identified within this integrative review: improving interhospital communication, improving time-based care, increasing positive health outcomes, prioritizing resource utilization, improving transfer decision making,

improving management of care expectations, and standardizing transfer protocols. The conceptual framework for this study was the Donabedian model for healthcare due to its utilization of stages of progress and implementation of health practices that had similar foundations to the structure of intervention for interhospital transfers. This review can be used for future studies on best practices related to the standardization of interhospital transfer protocols for hospitals, in addition to providing benefits to healthcare personnel and care team planning.

With standardization protocols, interhospital transfers opens the opportunity for several barriers and challenges toward patient care and safety to become dismantled. This can lead to improvements in the quality of care and overall efficiency of the hospital.

Recommendations for professional practice include:

- Recommendation 1: Hospitals involved within interhospital transfers should consider standardization of their transfer protocols that will highlight streamlined assessments regarding patient eligibility for transfer, the level of clinical information shared through EHR and other cross-operable programs. This will improve rates of timely care received by patients and provide a method for easier decision-making for providers when admitting transfer patients.
- Recommendation 2: Establishing an interhospital transfer care team could improve timeliness of care, while also increasing feelings of preparedness amongst providers and nurses. These care teams can more readily prioritize incoming patients, having an established clinical profile complete with

necessary results, medications, and other pertinent patient history that will aid in providing optimal care.

- Recommendation 3: Implementation and evaluation are important in ensuring the interventions that take place within a hospital provide the expected positive results. Considerations within evaluations should include time from transfer patient arrival to care plan implementation, rates of positive health outcomes, resource utilization percentages, and even staff personal development questionnaires that can all be used and compared to previous quarters within the year to determine any positive changes or areas in need of improvements.

As a growing occurrence experienced amongst hospitals, identifying best practices within interhospital transfers are critical in helping to improve patient safety, improving positive health outcomes, and providing positive measures of social change within the community. With the creation of clear protocols and assessment procedures, healthcare administrators and personnel can be more prepared to provide necessary interventions that will reduce barriers and challenges to care and ultimately improve outcomes for patients as well as metrics for the hospitals involved. Through the focus on protocols, patient eligibility, efficient care plan teams, and careful consideration of its implementation and alignment towards the social determinants of health, hospitals and other healthcare facilities can improve their services, which would have positive benefits for patients, healthcare personnel, and the larger community which the hospitals serve.

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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	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
Fernandes-Taylor, S., et al. (2021)	N/A	Smaller hospitals may experience operational deficits regarding communication and quality hand-offs during inter-hospital transfers	Multivariable logistic regression analysis	Out of the 47,442,892 Emergency Department encounters between 2008 and 2014, approximately 1.9% resulted in a transfer. Transfers were more likely to occur from rural hospitals, with higher odds seen within older patients and those with comorbid conditions	Age was a factor within inter-hospital transfers, as older patients were more likely to be transferred. Those deemed medically complex were also likely to be transferred.	Future research is needed to determine the specific needs rural hospitals face to improve overall outcomes of inter-hospital transfers and help to reduce costs.	Improving the adoption of clear guidelines for hospital communications and handoff procedures, better patient outcomes may be seen during inter-hospital transfers	No
Yu, A., et al. (2022)	Quality Care Coordination Measurement Framework and Agency for Healthcare Research Framework	What valuable insights can nurses provide on the key challenges hospitals face with inter-hospital transfers?	Qualitative (Semi-structure focus groups and interviews)	Study conducted from 2019 to 2020 with 21 inpatient nurses. Results were utilized with two frameworks (Agency for Healthcare Research and Quality Care Coordination Measurement) into three domains: communication, assessing needs and goals, and negotiating accountability	Key themes found were challenges related to information exchange/communication, preparation needed with anticipated transfers, and determining care plans and responsibilities for patients once they have arrived at the facility.	Future interventions can take place to create more standardized reports during handoffs, and timely access to clinician evaluations and admitting clinicians	By improving the communication and operational efficiency of inter-hospital transfers, improvements in communication can occur that would create a more streamlined IHT process.	Yes
Yu, A., et al. (2024)	The Agency for Healthcare Research Framework Care Coordination Measurement Framework	What are the experiences of physicians and advanced practice providers regarding interhospital transfers and	Qualitative Descriptive Study (Semi-structured interviews)	Academic Acute Care hospitals that accept approximately 4000 interhospital transfers annually were chosen for the study. 30 hospitalists were interviewed, with 2/3 being physicians and	Researchers found that expectations with care responsibilities and information exchange were challenging during the interhospital transfer process. There was a negative impact perceived on interhospital patient	Future research can be conducted regarding quality improvement measures on interdisciplinary communication, timely information	Healthcare administrators and providers can work towards building stronger relationships between transferring and	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
		what are ways to improve quality and patient safety?		1/3 being advanced practice providers	care and safety by those within the study.	transfer and a standardization process of interhospital transfers to improve overall care for patients.	accepting clinicians. They can also benefit from interdisciplinary training and expectations of care to improve consistency of care.	
Leven, E. A., et al. (2022)	N/A	What are the ways in which clinical information sharing can be enhanced for interhospital transfers to an inpatient hepatology service?	Email notification interventions sent to senior medicine residents over the patient triage department Likert Scale Surveys administered before and after email intervention	Before interventions, 31% of the residents that rotate through both primary team and triage resident roles did not feel prepared for incoming transfers vs 8% feeling not prepared after interventions took place. There was a significant reduction with the time of patient arrival to team assignment (TTA) for pre and post intervention (62 vs 40 minutes, p=0.01)	Researchers noted that having both early notifications and increased access to clinical information before transfers led to a more prepared staff, reduced delays in team assignments of incoming transfers, and reduction in overall time of patient arrival to team assignment.	By utilizing measures like transfer log interventions to measure time from patient arrival to team assignment, improvements may be seen with reductions in delays and improved communication between interdisciplinary groups.	Healthcare administrators and providers can adopt more standardized communication and transfer log protocols to provide baselines for hospitals in order to identify areas of concern for interhospital transfers.	Yes
Jaan, A., et al. (2025)	N/A	What is the role of interhospital transfer in lower gastrointestinal bleeding management and its impact on patient outcomes?	Retrospective cohort study (data used from National Inpatient Sample database from 2017-2020)	Researchers utilized 393,495 patients with lower gastrointestinal bleeding (LGIB). They found that out of the 8.02% that underwent interhospital transfers, patients had significantly higher inpatient mortality (AOR 1.96), had	Researchers found that LGIB patients had high risk of mortality, higher resource utilization, and increased need of procedural interventions.	Future research can take place to both optimize and standardize strategies to reduce barriers to care and increase operational efficiency and quality care for patients	Healthcare administrators and providers can find ways to reduce the length of stay in LGIB and other interhospital patients, which also can lead to more timely interventions to	No

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				increased risks of septic shock (AOR 2.11), and well as had higher resource utilization and longer length of stay (increase of 4.37 days).			reduce chances of illnesses and other complications occurring during the transfer process.	
Tossaint-Schoenmakers, R., et al. (2021)	Donabedian Model	Are there identifiable indicators in the structure/process and outcome factors that are related to the integration of eHealth? Which indicators of structure/process are related to outcome indicators?	Literature Review	Out of the 11 studies in the study, all studies were able to identify factors related to structure, process, and outcome indicators that could be related to the integration of eHealth. Factors such as care receiver, technology, and efficiency were amongst the most noted.	Researchers concluded that there are 3 key factors important for the successful integration of eHealth: 1) Incorporation of the care receiver into organizational structure 2) Well-attuned technology 3) Alignment of human resources	Future research with this framework may provide healthcare providers and administrators with effective measures to improve quality of care and patient outcomes by assessing the current quality of care and identifying key factors to improve, such as through the incorporation of eHealth.	Through utilization of this framework, hospital providers and administrators will be able to assess their current state of care as it relates to inter-hospital transfers, while also providing a structure for assessing any adopted models of care to improve hospital efficiency.	No
Tal, S., & Mor, S. (2021)	Donabedian Model	What impact does Helicopter Emergency Medical Services (HEMS) have on the status, process, and outcome measures of acute ischemic stroke patients?	Systematic Review	Researchers utilized Donabedian's Framework to focus on the impact of healthcare structure and to categorize articles. Findings showed there could be a relationship between acute management and inpatient treatment,	Researchers concluded that HEMS use was not found to be associated with a decrease in mortality when compared with EMS. It was also found that inter-hospital transfers led to a decrease in mortality rate.	Future research on assessing transfer services and its impact regarding helicopter emergency services may help to identify factors in identifying eligible patients in a more timely manner.	Healthcare administrators and providers can measure the assessment of new protocols and models of care. With this, hospitals can improve the efficiency of inter-hospital transfers and	No

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
				but further research would be needed.			overall operational functioning.	
Chen, K. C., & Wen, S. H. (2023)	N/A	What impact do interhospital transfers have on an emergency department's ability to provide timeliness of care?	Retrospective cohort study	Researchers conducted a study on 1,856 interhospital patients and 16,295 non-interhospital patients. They found that interhospital patients had increased risks of having a shorter emergency department stay, but a longer hospital stay, and higher odds of in-hospital mortality when compared with the non-interhospital transfer population.	It was concluded that interhospital transfers led to increased risks of adverse outcomes when compared to non-interhospital patients, especially as it relates to having increased odds of in-hospital death.	Through further research, more reasoning may be provided on the cause for longer timeliness of care of interhospital patients, such as deficient interhospital communication and handoff documentation, which can cause delays in diagnosis and treatment.	Healthcare administrators and providers can work towards increasing operational efficiency in the way of hospital bed measurement, standardization of the information included in interhospital communication, during transfers, and complete medical data transfer during the process.	No
Alagoz, E., et al. (2022)	Relational Coordinate Framework (RCF)	What is the nature and challenges with communication between referring and accepting providers of transferred emergency general surgery patients from the viewpoint of transfer center nurses?	In-person interviews of transfer center nurses (TCN)	Transfer center nurses described transfers as lacking efficiency and that there being a communication deficit between referring and accepting providers. There was also a consensus amongst the nurses that a lack of structure regarding transfers was present.	Due to inconsistencies with communication between referring and accepting providers, along with incomplete transfer information, many transfer center nurses felt tension and a lack of structure.	Future research can take place on the methods of communication currently available at hospitals during interhospital transfers and ways in which it can be more standardized across transfer processes to provide adequate information from referring facilities	By helping to streamline the transfer process, healthcare administrators and providers can improve the sharing of complete and appropriate information on the transfer patients. This may help interhospital transfers run	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
						to accepting facilities.	more efficiently and for transfer staff to feel more comfortable and capable of completing their jobs efficiently.	
Song, J., et al. (2024)	N/A	Is there an association between interhospital transfers and in-hospital mortality?	Retrospective Observational Study (from the National Emergency Department Information System (NEDIS) 2016-2018)	Of the approximate 2 million patients admitted to emergency medical center, 28.2% underwent interhospital transfer. In-hospital mortality rates were higher within the transfer group and interhospital transfers were found to be an independent predictor of in-hospital mortality	Inter-hospital transfers can be a key factor in association with increased chances of in-hospital mortality.	Future research on policies to help reduce risks associated with inter-hospital transfer patients may help lower in-hospital mortality. This can especially be an improvement for patients who are medically complex and critically ill or who are having an acute phase response or other comorbidities.	Mitigating risks with inter-hospital transfers can be a focal point for healthcare administrators to help improve operation efficiency in hospitals. By adjusting factors such as transfer time, length of stay, and improve ways to address critically ill and medically complex patients may help to reduce in-hospital mortality rates.	Yes
Baig, S., et al. (2022)	N/A	Lower-risk, medical ICU transfer patients will have longer length of stay when compared to non-transferred patients with similar risk profile without a	Retrospective Cohort Analysis	Researchers noted that transfer patients had higher hospital and ICU length of stay. In addition to this, mortality rates were higher amongst transfers.	Researchers found that inter-hospital transfer patients who were critically ill but had lower illness severity were still associated with higher ICU and hospital utilization and increased mortality.	Future research implications surround patient transfer identification facts and have more understanding of how interhospital transfers impact ICU resource utilization, quality	By noting that regardless of illness severity, there was still found to be an association amongst all transfer patients with increased mortality and higher utilization	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
		difference in mortality				of care and efficiency.	levels, healthcare administrators can seek to improve quality metrics and improve care in the modes of quality and utilization.	
Lee, H., et al. (2023)	N/A	What are the factors affecting Emergency Department Length of Stay for transferred critically ill patients?	Retrospective Analysis with logistic regression	Results from the study confirm that there is a need for an effective referral procedure between hospitals and departments to minimize delay in the length of stay of critically ill patients in emergency departments. Results also showed that having a streamlined critical pathway protocol for the treatment of certain severities can result in a decrease in length of stay and a better prognosis.	Researchers found that the use of prediction models relating to the length of stay within emergency departments had a positive impact on the timeliness of treatment for transferred patients.	Future research on specialized prediction models regarding length of stay and resource utilization can be helpful tools in helping improve timeliness of care, quality handoff procedures between hospitals, and improved communication methods.	By understanding what factors determine the length of stay within emergency departments of transferred patients, healthcare administrators will be able to improve efficiency, quality of care, and resource utilization.	No
Ludwig, A., et al. (2024)	N/A	What are the knowledge gaps that persist related to inter-hospital transfers of patients with acute respiratory failure (ARF)?	Retrospective Analysis	Researchers found that the outcomes between inter-hospital transferred patients and those not transferred did not differ in terms of mortality, however there was a difference in terms of resource	Researchers noted that of the patients transferred, the majority were found to be younger, insured, and had higher severity of illness when compared with non-transferred patients.	Future research is needed to examine whether transfer of acute respiratory failure (ARF) patients is an appropriate intervention. More research can also be conducted on	By establishing adequate transfer networks for patients with ARF or other critical illnesses, healthcare administrators may help to improve transfer	No

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
				utilization (length of stay). Transferred patients were found to have longer length of stay.		the impact these transfers have on waiting times, outcomes, resource utilization, and mortality rates.	access to hospitals that are highly equipped and capable of providing specialized services. This may help to lower capacity straight at high resourced hospitals, reduce delay in care, and lower resource utilization.	
Allen, L., et al. (2021)	N/A	Patients who are transferred to a tertiary acute care surgery (ACS) center will have more complication compared to patients admitted directly to tertiary ACS centers	Secondary Analysis	Of the 1,846 patients included in the study, 9.5% (176) were transferred. When compared with patients who were directly admitted to an acute care surgery center, transfer patients had higher rate of complications (48% vs 31%), a greater likelihood of being admitted to the ICU (22% vs 12%) and was more likely to undergo a second operation (28% vs 14%)	Researchers concluded that emergency general surgery patients with complexities who were transferred to acute care surgery centers may have worse outcomes and higher utilization of resources when compared to patients who admitted to these centers directly.	Future research on the differences between transfer patients and directly admitted patients to acute care surgery centers may help improve regionalization of care and help with the adoption and utilization of more standardized transfer guidelines and resource allocation and utilization.	Regionalization can be a strategy utilized by healthcare administrators to help better identify patients that are most appropriate for transfers and can help financially as it relates to resource allocation and operational efficiency.	No
Nadig, N., et al. (2022)	N/A	What are the inter-ICU transfer patterns and the impact of transfer timing on	Retrospective Quasi-Experimental	Researchers found that of the 6,718 patients with acute respiratory failure, 68% were transferred early. Those patients	Researchers concluded that earlier transfers are associated with favorable patient outcomes and can be a key factor in	Future research on evidence-based transfer procedures and policies may be used to improve	Because there are no evidence-based guidelines for inter-ICU transfer of acute respiratory	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
		patient-centered outcomes?		had a 55.8% reduced risk of in-hospital mortality than patients who were transferred later. Earlier transferred patients also had reduced length of stay (8 days compared with 22 days for later transfers)	evaluating transfer procedures and policies	patient outcomes and reduce utilization	failure (ARF) patients, healthcare administrators can help to develop standardized protocols that not only focus on patient safety but also on health system outcomes in terms of length of stay and cost. They can also consider factors such as interdisciplinary teams and families that all would be stakeholders during the transfer process.	
Fernandes- Taylor, S., et al. (2023)	Relational Coordination Framework	A higher proportion of emergency general surgery patients transferred between hospitals would result in better outcomes	Retrospective Cohort Analysis	Over the two-year period (2016-2018) of this multicenter study, researchers found that of the 3,197 emergency general patients who were transferred, 1,131 experienced in- hospital morbidity (25%), mortality (4%), or had an increased length of stay (25%)	Coordination between facilities during transfer can have a larger impact on quality outcomes for transferred patients.	Future research on evidence-based transfer protocols may help to improve handoffs and can be used to improve handoff templates to help existing transfer relationships between hospitals to promote better patient outcomes	Healthcare administrators can initiative intervention methods that can focus on standardizing patient clinical information during handoffs to provide more accurate communication and more timely decision-making	No

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							during the transfer process.	
Sakowitz, S., et al. (2023)	N/A	Transferred patients will experience increased complications and mortality after nonelective cholecystectomy as well as require greater resource use.	Retrospective Cohort Study (National Inpatient Sample)	Of the approximately 530,696 patients, 5.3% were found to have been transferred. These patients were found to have increased odds of infectious complications (AOR 1.31) and non-home discharge (AOR 1.59; 59% increased chance). Researchers did not find a difference in mortality rates.	Researchers noted that patients undergoing inter-hospital transfer were associated with greater postoperative infection risks. These patients also experience increased lengths of stay.	Future research on quality improvement efforts to reduce infection rates and + their spread to patients during inter-hospital transfers may help with infection prevention	Because prolonged hospital stay is a key risk factor for infection, healthcare administrators can investigate transfer timing within hospitals to help reduce resource utilization and length of stay. This may have a positive impact on reducing occurrences of postoperative infections caused by lengthen stays.	No
Emanuelson, R, et al. (2022)	N/A	What are the outcomes related to interhospital transfer and what factors can be identified as opportunities for improvement?	Meta-Analysis	Researchers noted that patients who were transferred had a median length of stay (LOS) ranging from 4-14.4 days, while non-transferred patients had a LOS that ranged from 2-5.8 days. It was also found that emergency general surgery transfers had mortality rates ranging from 2.3%-12.6%, while those	Researchers concluded that emergency general surgery patients have higher rates of comorbidities (with hypertension being the most prevalent). It was also concluded that limited patient knowledge on physiological status prior to transfers may limit understanding of the necessity for transfer.	Based on the results of this study, future research on pretransfer patient information platforms may help in the timely sharing of patient information, overall status, and access opportunities to specialty care. This may also help in the decision-making	Operational efficiency and mortality rates from inter-hospital transfers may be lowered through the utilization of a data registry system that includes overall physiological status for emergency general surgery patients. This will help	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
				not transferred had rates ranging from 0.4%- 3.1%.		process in determining if transfer is necessary.	healthcare administrators ensure that inter-hospital transfer protocols are adopted and improve patient care.	
Teng, C., et al. (2021)	N/A	What are emergency general surgery transfer patterns and what factors are associated with avoidable transfers?	Retrospective Cohort Study	There were 514,410 patient cases used for this study, with 5.1% involved in interhospital transfers. Of the transfer patients, 27.4% were found to be potentially avoidable. Factors relating to potentially avoidable transfers were self-pay status, the history of psychiatric or substance use disorder, and intestinal obstruction.	Researchers concluded that over 1 in 4 emergency general surgery transfers are potentially avoidable. Factors such as validated risk stratification tools for various patient conditions and policies that are aligned with the appropriateness of patient care can help improve the transfer process.	Patient-level and hospital-level factors can be used for future research for quality improvement and policy development for more efficient transfer systems and positive patient outcomes. Further research on improving transfer triage may also help support staff and improve efficiency.	Healthcare administrators may find that helping to establish or contribute to a registry for patients with emergency general surgery conditions may help to improve quality improvement in hospitals and can lead to decreasing potentially avoidable transfers and resource utilization. By helping to avoid transfers that aren't necessary, hospitals may also see improvements in adequate staffing coverage.	No
Mueller, S., et al.(2021)	N/A	What are the experiences of transferred	Qualitative-Interview	Researchers noted three key factors in the decision to	It was concluded that there were several deficiencies found within	Future research on this topic may help in the	By understanding the areas of	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
		patients' and physicians' with interhospital transfers? What are the potential targets for improvement?		transfer: receiving more specialized care, familiarity with a physician, expediting diagnostic/therapeutic testing. It was found that both patients and physicians expressed dissatisfaction with the unpredictable timing nature of transfers. Physicians also felt a disconnect in communication as it related to the referring and accepting physicians during the transfer process.	the transfer process: transfer timing and lack of advanced notice, disorganization in communication, and unreliable/ineffective communication of clinical information.	generalizability of these findings and help improve hospital management of interhospital transfers. Research can also help to establish expectations during the transfer process between transferring and accepting hospitals.	concern expressed by patients and physicians, healthcare administrators can utilize that data to help quality improvement. This can be in the form of enhancing information technology to help in the sharing of clinical information and tracking the status of patients in the transfer process to help reduce delays of care.	
Stamm, B., et al. (2023)	N/A	What is the median door-in-door-out time for inter-hospital transfer of patients with stroke? What are the patient and hospital-level factors associated with door-in-door-out time?	Retrospective Cohort Study	108,913 patients were found to be transferred; 70.7% of transferred were due to advanced stroke care, 20.3% for endovascular therapy, and 10.8% for IV thrombolysis management. Urban hospitals were found to have prolonged door-in-door-out times	Researchers concluded that due to patients experiencing hemorrhagic stroke at rural hospitals having twice the odds of in-hospital mortality than those in urban hospitals, transfer rates were higher. It was also concluded that patients undergoing endovascular therapy from rural hospitals had worse patient outcomes, which could be due to delays in reperfusion.	Future research analyzing operational differences in rural and urban hospitals may be a positive quality improvement initiative. Studying factors such as median door-in-door-out time and odds of in-hospital mortality may also help in that goal.	Healthcare administrators and providers in rural hospitals with higher door-in-door-out times for stroke patients can work to identify possible factors such as disparities within patient population, timeliness of referrals and	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
				compared with rural hospitals.			providing a record of updated patient profiles to help with quality improvement initiatives.	
Taghlabi, K., et al. (2024)	N/A	What are the perioperative outcomes between patients transferred from other facilities and those directly admitted? Are there any predictors of complications and mortality?	Retrospective Cohort Study	Researchers found that of the patients in the study, 12.2% were transferred, while 87.8% were directly admitted. Transfer patients were found to have longer hospital length of stay 5.1-5.7 days vs 4.5-4.6 days for direct admits. Transfer patients were also found to have higher rates of surgical site infection, sepsis, and postoperative reintubation compared with direct admits. Those who were transfer patients were also found to have higher 30-day mortality rates compared to direct admits.	Research concluded that inter-hospital transfers were a key factor in higher hospital length of stay, increased postoperative morbidity rates, and higher mortality rates within thoracolumbar spine surgery.	Further research is needed to understand how certain patient baseline characteristics like comorbidities can affect patient outcomes pre- and post-surgery. Further research on resource utilization and impact on transfer patients can also be used to help optimize resource use and better standardize patients qualified for transfer.	To help reduce factors of increased rates of postoperative morbidity and higher mortality rates within certain surgeries, healthcare administrators can work to adopt and utilize postoperative monitoring strategies to better access patient profiles before and after surgery. Other factors to improve operational efficiency would be to identify patients with significant comorbidities earlier to provide optimal outcomes pre- and post-surgery.	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
Bergmark, R., et al. (2023)	N/A	There are clinically significant associations between hospital network centrality and patient outcomes	Retrospective Cross-Sectional Study	Inpatient cohorts were utilized from Florida (approx. 1.2 million) and California (approx. 1.4 million). It was found that peripheral hospitals had higher in-hospital mortality rates and longer length of stay than central hospitals for both states. Hospitals located in the middle quartiles had lower in-hospital mortality rates compared to central hospitals.	The geographical position of hospitals within an inter-hospital network has an association on patient outcomes. Those located within peripheral or central positions could experience deficient quality of patient outcomes.	Further research on the healthcare utilization and interdependence of hospitals along with location may help healthcare administrators examine how patient outcomes can be influenced by the hospital network in their area. Quality improvement measures can then be made once hospitals are determined to be in less optimal areas within their network.	Risk adjustment of patient outcomes, inpatient mortality rates, and length of stay can be key factors for healthcare administrators to determine their hospital's interdependence on nearby hospitals for transfers and may help to define vulnerabilities that can be more quickly addressed.	No
DeBerry, J., et al. (2023)	N/A	What are the potential barriers and facilitators that may exist during the transfer process from both receiving and referring physicians?	Qualitative Descriptive Study- Interviews	Researchers found that barriers to interhospital transfer included inefficient communication, increased subjectivity in the decision to transfer certain patients, delays in patient data communication, and lack of resource utilization efforts (operational barriers- lack of beds, etc.)	Operational barriers were found to be substantial within the transfer process. Lack of bed availability and resource utilization options coupled with other key findings may result in negative patient outcomes.	Further research on barriers of inter-hospital transfers can be utilized for healthcare administrators to more easily identify operational deficiencies that can lead to adverse patient outcomes. This can be in the form of resource utilization, in-hospital mortality,	Improving barriers to care through quality improvement strategies can help healthcare administrators to mitigate communication gaps between referring and receiving hospitals, standardize expectations for transfer processes, and provide more patient data	Yes

Author/ Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for Future research	Implications For practice	Empirical Research (Yes or No)
						and increase risk of infection.	communication for both pre-and post-transfers	

Appendix B: DHA Review Question(s) Search Log

Search Results

Database or location name	Search Terms	Results	Notes
Google Scholar	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	10	-Narrower search with better framed studies Removed 2 duplicates -8 articles were utilized for inclusion and exclusion screening
Google Scholar	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	1	N/A
PubMed (National Library of Medicine)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	91	-Several articles highlighted risk factors of interhospital transfer depending on illness/injury type 23 articles were removed for duplicity 68 articles utilized for inclusion and exclusion screening
PubMed (National Library of Medicine)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	44	-Lots of comparisons of efficiency regarding interhospital transfer by helicopter and by ground 11 were removed for duplicity 33 articles utilized for inclusion and exclusion screening
PubMed (National Library of Medicine)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	65	-Some great sources found that researched medical professional perspective of interhospital transfer and impact depending on geographic area (rural vs urban) 18 articles removed for duplicity 47 articles utilized for inclusion and exclusion screening
PubMed (National Library of Medicine)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best	44	-A few sources spoke on the impact that AI and other implementations can have on improving interhospital

Database or location name	Search Terms	Results	Notes
	practices, communication, data, resource utilization		transfer- many within other countries 15 articles removed- duplication 29 articles utilized for inclusion and exclusion screening
Sage Journals	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	0	-Search criteria needed to be more detailed/narrow
Sage Journals	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	107	-Several articles spoke of barriers to interhospital transport services and the connections between health outcomes of patients and their resource utilization 15 articles removed for duplication 92 articles utilized for inclusion and exclusion screening
American Public Health Publications (APHA)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	5	-Broaden search – more generalized 1 article removed for duplication 4 articles utilized for inclusion and exclusion screening
American Public Health Publications (APHA)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	20	-Greater search results with broader terms 3 articles removed- duplication 17 articles used for inclusion and exclusion screening
American Public Health Publications (APHA)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	6	-Several articles researched the roles of race and poverty within health transfers 3 articles removed for duplication 3 articles utilized in inclusion and exclusion screening
ScienceDirect: Public Health	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	1	-One journal entry within a timeframe of 5 years or less. No other search phrases yielded results

Database or location name	Search Terms	Results	Notes
			1 article utilized for inclusion and exclusion screening
Scientific Research (Journal)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	2	-No other search phrases yielded results 2 articles utilized for inclusion and exclusion screening
JSTOR	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	62	-Several articles found that focused on insurance inequities in treatment of patients as well as the incorporation of more advanced telemedicine options 7 articles removed for duplicity 55 articles utilized for inclusion and exclusion screening
JHQ (Journal for Healthcare Quality)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	2	-Only one article within 5-year timeframe parameter 1 article removed 1 article utilized for inclusion and exclusion screening
JHQ (Journal for Healthcare Quality)	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	5	-A few articles stated the various communication methods that had the best (or even adverse) effects on the patient transfer processes 3 articles removed 2 articles utilized for inclusion and exclusion screening
Patient Safety Network	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	19	-Several articles spoke on safety strategies during interhospital transfers 4 removed for duplicity 15 articles utilized for inclusion and exclusion screening
Patient Safety Network	Interhospital, OR transfer, impact, 2021-present, OR transfer efficiency, barriers, challenges, OR best practices, communication, data, resource utilization	6	-More defined search results: a few articles focused on challenges during Covid-19 2 articles removed for duplicity

Database or location name	Search Terms	Results	Notes
			4 articles utilized for inclusion and exclusion screening

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
<p>Fernandes-Taylor, S., Yang, D. Y., Schumacher, J., Ljumani, F., Fertel, B. S., & Ingraham, A. (2021). Factors associated with Interhospital transfers of emergency general surgery patients from emergency departments. <i>The American Journal of Emergency Medicine</i>, 40, 83–88. https://doi.org/10.1016/j.ajem.2020.12.012r text</p>	<p>Level III High Quality</p>	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: -The purpose of this study was to determine if smaller hospitals may experience operational deficits regarding communication and quality hand-offs during interhospital transfers</p>	<p>- There is a lack of generalization amongst interhospital transfers (i.e. gaps in communications for the patients and medical staff, and worse outcomes of patients after transfer). - High variability in length of stay (resource utilization) and patient transfer criteria for interhospital transfers. - Study highlights rural hospitals and their heavy reliance on transfers due to lack of appropriate staff and equipment and the necessity in reducing resource utilization (i.e. hospital beds)</p>	<p>Multivariable logistic regression analysis</p> <p>-Researchers utilized data from the Agency for Healthcare Research and Quality Nationwide Emergency Department Sample (NEDS) - Adult patients with emergency general surgery conditions were identified (47,442,892). -Referring hospital and patient clinical characteristics were identified</p>	<p>- NEDS is not validated for specific clinical settings and is instead a population-level data set -Researchers are unable to use NEDS to characterize post-transfer hospitalization of patients, making EGS patient outcomes, mortality, morbidity, and cost all unqualifiable.</p>
<p>Yu, A., Jordan, S.R., Gilmartin, H. et al. (2022). “Our hands are tied until your doctor gets here”: Nursing perspectives on inter-hospital Transfers. <i>Journal of General Internal Medicine</i>, 37, 1729–1736. https://doi.org/10.1007/s11606-021-07276-5t</p>	<p>Level III High Quality</p>	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The study sought to provide nurse insights on the key challenges hospitals and their profession face with</p>	<p>-There is hospital challenges related to information exchange/communication, preparation needed with anticipated transfers, and determining care plans and responsibilities for patients once they have arrived at the facility.</p>	<p>Qualitative (Semi-structure focus groups and interviews)</p> <p>-Semi-structured interviewing guide used to help explore nursing experiences with interhospital transfers and solutions to common challenges -200 nurses were invited to participate in the study, though only 21 participated</p>	<p>-Study had a response rate of 10.5% across all focus groups and fourteen interviews, hindering its ability to be generalized</p> <p>-All results from interviews and focus groups took place at the same facility</p>

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		interhospital transfers		-Nurses had the choice to participate in individual interviews or focus groups	
<p>Yu, A., McBeth, L., Westcott, C., Nicklas, J. M., Mueller, S., Dorsey Holliman, B., Ozkaynak, M., & Jones, C. D. (2024). Information exchange, responsibilities and expectation management in interhospital transfers: a qualitative study of hospital medicine physicians and advanced practice providers. <i>BMJ Open Quality</i>, 13(3), e002768. https://doi.org/10.1136/bmjog-2024-002768</p>	Level III Good Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of the study was to gain insight into the experiences of physicians and advanced practice providers regarding interhospital transfers and the ways to improve quality and patient safety</p>	<p>The study identified 3 key areas that impact the experiences of hospitalists towards interhospital transfers:</p> <ul style="list-style-type: none"> -1) Information exchange and communication between providers and nurses, along with referring and receiving hospitals -2) Responsibilities during interhospital transfers and how this process can be complicated due to a lack of information shared amongst staff leading to feelings of unpreparedness 3) Expectation management of patients during interhospital transfer. 	<p>Qualitative Descriptive Study (Semi-structured interviews)</p> <ul style="list-style-type: none"> -30 hospitalists interviewed (physicians and advanced practice providers) -Participants recruited through email and hospital meetings 	<ul style="list-style-type: none"> -Study completed at a single facility, which affects its ability to be generalized. -Clinicians who were familiar with the research team opted to self-select to participate in the study to discuss their negative experiences with interhospital transfers, potentially making the data bias
<p>Leven, E. A., Luo, Y., Nguyen, V. T., & Pourmand, K. (2022). Enhanced Communication for Interhospital Transfers Increases Preparedness in an Academic Tertiary Care Center. <i>Applied Clinical Informatics</i>, 13(4), 811–819. https://doi.org/10.1055/s-0042-1756371</p>	Level III Good Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of the study was to help determine various</p>	<p>-Email notifications providing key clinical information about incoming interhospital transfers were associated with reductions in delays of care and more timely care plan being enacted</p> <p>- Before interventions, 31% of the residents that rotated through both primary team and triage resident roles did not feel prepared for incoming transfers vs 8% feeling</p>	<p>Email notifications to senior medicine residents within the patient triage department</p> <p>Likert Scale Surveys administered before and after email intervention</p>	<p>Because the interventions of the study took place during the ending of one academic year and the beginning of another, the triage resident participants within the initial group were different than those in the upcoming year, which could impact</p>

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		ways clinical information sharing can be improved for interhospital transfers within an inpatient hepatology department	not prepared after interventions took place.		experiences and interpretation of results
Jaan, A., Sarfraz, Z., Maryyum, A. et al. (2025). The impact of inter-hospital transfer on outcomes in lower gastrointestinal bleeding: a retrospective cohort analysis. <i>BMC Gastroenterol</i> 25, 183. https://doi.org/10.1186/s12876-025-03755-9	Level III High Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to determine the impact of interhospital transfer on patient outcome for patients needing management for lower gastrointestinal bleeding</p>	<p>-Lower gastrointestinal bleeding (LGIB) transfer patients had higher probabilities of inpatient mortality (AOR 1.96), had increased risks of septic shock (AOR 2.11), and well as had higher resource utilization and longer length of stay increased length of stay by approximately 4 days.</p> <p>-Transfer patients also experienced higher comorbidity scores and higher resource utilization, with increased total hospital costs.</p>	<p>Retrospective cohort study (data used from National Inpatient Sample database from 2017-2020)</p> <p>-393,495 adult patients with LGIB were included</p> <p>-8.02% of patients were interhospital transfers while 91.98% were direct admits</p>	-Due to retrospective nature of study design, complete randomization of cohorts was limited
Chen, K. C., & Wen, S. H. (2023). Impact of interhospital transfer on emergency department timeliness of care and in-hospital outcomes of adult non-trauma patients. <i>Heliyon</i> , 9(2), e13393. https://doi.org/10.1016/j.heliyon.2023.e13393	Level III Good Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The study was to examine the impact</p>	<p>- Interhospital patients had increased risks of having a shorter emergency department stay, but a longer hospital stay</p> <p>-Interhospital patients and higher odds of in-hospital mortality when compared with the non-interhospital transfer population</p>	<p>Retrospective cohort study</p> <p>-Performed at a tertiary referral hospital</p> <p>-Obtained de-identified patient data from electronic record system and reviewed by two abstractors who were not informed of the purpose of the study</p>	Potential for unmeasured differences between both cohorts (interhospital transfers and non-interhospital transfers) due to the research analyzing pre-existing data

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		interhospital transfers have on an emergency department's ability to provide timeliness of care		-Out of 20,675 patients identified, 2,373 were excluded. -1,856 were interhospital transfer patients -16,295 were non-interhospital transfers	
Alagoz, E., Saucke, M., Arroyo, N., Fernandez Taylor, S., & Ingraham, A. (2022). Communication During Interhospital Transfers of Emergency General Surgery Patients: A Qualitative Study of Challenges and Opportunities. <i>Journal of patient safety</i> , 18(7), 711–716. https://doi.org/10.1097/PTS.0000000000000979	Level III High Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of this study was to determine challenges with communication between referring and accepting providers of transferred emergency general surgery patients from the viewpoint of transfer center nurses	-Researchers noticed a deficiency in communication between referring and accepting providers before transfer takes place. -This was due to a lack of patient summaries for transfer center nurses, inconsistencies in patient staffing, higher resource utilization, and a potential adverse impact on patient health relating to capacity and the determination of patient eligibility for transfer.	In-person interviews of transfer center nurses (TCN) -17 nurses interviewed on communication between referring physicians and admitting physicians -Transcripts of the recorded interviews were then coded	-Results may not be generalizable due to all data collection took place at one facility -Possibility of recall bias from participants
Downer, T., Halsall, R., Cole, R., Thomas, C., & Kearney, L. (2023). Nonurgent Pediatric Interhospital Transfers: A Narrative Enquiry of Nurses' Experiences in Australia. <i>Journal of emergency nursing</i> , 49(4), 564–573.e1. https://doi.org/10.1016/j.jen.2022.12.007	Level III Good Quality	HSO: Hospital System Research Domain: Quality Improvement	Themes of inadequate preparation, inefficient patient handover, and risks of safety for both patients and nursing staff were found. -Based on results, nurses would feel more comfortable with pediatric interhospital transfers	Qualitative Narrative inquiry through the experience of nurses	-Small sample size -No data saturation or an adequate amount of diversity of experiences

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		<p>Problem Addressed: The purpose of this study was to analyze the experiences and perceptions of nurses who take part in nonurgent pediatric interhospital transfers</p>	<p>with clarified and properly defined training and safety standards. Researchers found that when introducing a standardized procedure to help with efficiency of pediatric interhospital transfers, more guidance was provided on patient management. which was associated with improved patient outcomes.</p>		
<p>Baig, S. H., Gorth, D. J., & Yoo, E. J. (2022). Critical Care Utilization and Outcomes of Interhospital Medical Transfers at Lower Risk of Death. <i>Journal of intensive care medicine</i>, 37(5), 679–685. https://doi.org/10.1177/08850666211022613</p>	<p>Level III High Quality</p>	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to address the research hypothesis that lower-risk, medical ICU transfer patients will have longer lengths of stay when compared to non-transferred patients with similar risk profile and no difference in mortality</p>	<p>Higher occurrences of resource utilization and longer hospital length of stay were found within interhospital transfer patients. -Transfer patients had higher odds of in-hospital mortality. -Factors that aid in patient selections for interhospital transfers could be improved to reduce negative impacts on care efficiency and resource utilization. -Higher odds of in-hospital mortality and increased resource utilization (length of stay) may be linked to delays in care and inefficient communication from referring and accepting hospitals.</p>	<p>Retrospective Cohort Analysis</p> <p>-Philips eICU research database was utilized -Adult patients admitted to ICUSs between 2014 and 2015 were considered -77,028 records used within study (2,483 in the transfer group)</p>	<p>-All the data collected for the study was from facilities that were a part of a telemedicine program -Hospital profile and patient transfer reasons were not available which could impact data</p>

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Lee, H., Lee, S., & Kim, H. (2023). Factors affecting the length of stay in the emergency department for critically ill patients transferred to regional emergency medical center. <i>Nursing open</i> , 10(5), 3220–3231. https://doi.org/10.1002/nop2.1573	Level III Good Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of the study was to determine what factors affect the Emergency Department's length of stay (LOS) for transferred critically ill patients	-There was an identified lack of efficient hand-off communication amongst 712 patients which impacted length of stay within the Emergency Department. - Researchers concluded that adherence to a communication protocol amongst referring and accepting hospitals could improve the quality of care. - Incorporating a standardized process for transfers can provide great insights into improving quality of care.	Retrospective Analysis with logistic regression -968 records of patients who were critically ill and transferred from the emergency department to a tertiary hospital	-Study conducted at one facility -Study only included critically ill patients, possibly hindering ability to be generalizable
Ludwig, A., Slota, J., Nunes, D. A., Vranas, K. C., Kruser, J. M., Scott, K. S., Huang, R., Johnson, J. K., Lagu, T. C., & Nadig, N. R. (2024). Interhospital Transfer of Patients With Acute Respiratory Failure in the United States: A Scoping Review. <i>Critical care explorations</i> , 6(7), e1120. https://doi.org/10.1097/CCE.0000000000001120	Level III Good Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of the study was to determine the knowledge gaps that persist related to inter-hospital transfers of patients with acute respiratory failure (ARF)	- A lack of standardization exists in relation to the criteria for patient transfers -Through survey data, researchers discovered that disagreements occurred amongst stakeholders on eligibility of transfer patients. -Transfer patients were found to have higher rates of resource utilization and longer lengths of stays. -By formalizing the transfer process, there may be an improvement in decreasing resource utilization and a more standardized process of eligibility requirements for transfer.	Retrospective Analysis Articles that were utilized described or evaluated the process of interhospital transfers of adult patients with acute respiratory failure (ARF) from 2020-2024	-Research only included U.S. articles -ARF patient data was heterogenous, impacting generalizability

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<p>Allen, L., Vogt, K., Joos, E., van Heest, R., Saleh, F., Widder, S., Hameed, M., Parry, N. G., Minor, S., & Murphy, P. (2021). Impact of interhospital transfer on patient outcomes in emergency general surgery. <i>Surgery</i>, 169(2), 455–459. https://doi.org/10.1016/j.surg.2020.08.032</p>	<p>Level III High Quality</p>	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of the study was to examine the hypothesis that patients who are transferred to a tertiary acute care surgery (ACS) center will have more complication compared to patients admitted directly to tertiary ACS centers</p>	<p>-Transfer patients had higher rate of complications compared to non-transfer patients (48% vs 31%) -Transfer patients had a greater likelihood of being admitted to the ICU (22% vs 12%) compared to non-transfer patients and were more likely to undergo a second operation (28% vs 14%)</p>	<p>Secondary Analysis -Data was retrospective of all emergency general surgery (EGS) patients -Mann-Whitney tests used to determine effect of transfer status of patients regarding mortality, complications, and duration of ICU stay</p>	<p>-Due to the small number of transferred patients utilized in study, it could limit the effectiveness of the regression analysis -Due to nature of secondary analysis, several aspects specific to transferred patients were not able to be captured (reason for transfer, information on referring vs admitting facility)</p>
<p>Nadig, N. R., Brinton, D. L., Simpson, K. N., Goodwin, A. J., Simpson, A. N., & Ford, D. W. (2022). The Impact of Timing on Clinical and Economic Outcomes During Inter-ICU Transfer of Acute Respiratory Failure Patients: Time and Tide Wait for No One. <i>Critical care explorations</i>, 4(3), e0642. https://doi.org/10.1097/CCE.0000000000000642</p>	<p>Level III Good Quality</p>	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to determine the patterns of inter-ICU transfers and the impact of transfer timing on</p>	<p>-Earlier interhospital transfer (within two days) of ARF patients was associated with an approximate 20.5% risk reduction of in-hospital mortality. -Early transfer patients were found to be associated with lower length of stay in the hospital. There is no current evidence-based guideline for inter-ICU transfer for ARF patients or for generalized transfer. -Though earlier transfer shows promise in reducing adverse outcomes, there were no consistent patterns of protocol or eligibility</p>	<p>Retrospective Quasi-Experimental -Utilized Agency for Healthcare Research and Quality’s Healthcare Cost and Utilization Project State Inpatient Databases (HCUP-SID). -5 states chosen for data collection for their geographical diversity (Florida, Maryland, Mississippi, New York, and Washington)</p>	<p>-Geographic areas missed within the study -Discrepancies and variabilities in coding practices led to inability to verify certain patient information</p>

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		patient-centered outcomes	<p>requirements found amongst the data within the study.</p> <p>-Of the patients with acute respiratory failure, 68% were transferred early, resulting in a 55.8% reduced risk of in-hospital mortality than patients who were transferred later.</p> <p>-Earlier transferred patients had reduced length of stay (8 days compared with 22 days for later transfers)</p>		
<p>Fernandes-Taylor, S., Yang, Q., Yang, D. Y., Hanlon, B. M., Schumacher, J. R., & Ingraham, A. M. (2023). Greater patient sharing between hospitals is associated with better outcomes for transferred emergency general surgery patients. <i>The Journal of trauma and acute care surgery</i>, 94(4), 592–598. https://doi.org/10.1097/TA.0000000000003789</p>	Level III High Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to address the hypothesis that a higher proportion of emergency general surgery patients transferred between hospitals to receive care would result in improved outcomes</p>	<p>-Incorporating protocols for transfer patients lead to more complete clinical information, improved communication from referring and admitting hospitals, eligibility, and an agreement on whether a patient meets the degree to transfer. -Having standardization during the transfer process may lead to lowering rates of delayed care and improving efficiency and communication amongst providers and other medical personnel.</p>	<p>Retrospective Cohort Analysis</p> <p>-Wisconsin Hospital Association data on emergency general surgery patients used for the years 2016-2018</p> <p>-Association between the number of emergency general surgery patients transferred between hospitals and patient outcomes</p>	<p>Patient outcomes for the long-term were not utilized</p> <p>-Due to rural market concentration of Wisconsin, results are not able to be generalized for other states</p>
<p>Stamm, B., Royan, R., Giurcanu, M., Messe, S. R., Jauch, E. C., & Prabhakaran, S. (2023). Door-in-Door-out Times for Interhospital Transfer of Patients With Stroke. <i>JAMA</i>, 330(7), 636–649. https://doi.org/10.1001/jama.2023.12739</p>	Level III High Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p>	<p>-On average, approximately 72% of patients had door-in-door-out times over 120 minutes.</p> <p>-Compared to other groups, patients with hemorrhagic stroke were found to have faster door-in-</p>	<p>Retrospective Cohort Study</p> <p>-Patients with ischemic or hemorrhagic stroke were selected from 2019-2021</p>	<p>The NIHSS score that was used in the study was found to be missing 21.4% of its sample that included a large number of patients who</p>

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		<p>Problem Addressed: The purpose of this study was to determine the median door-in-door-out time for interhospital transfers of stroke patients.</p> <p>To determine the patient and hospital-level factors associated with door-in-door-out time</p>	<p>door-out times due to having a standard protocol for transfer. -These protocols involved established criteria for screening and identification of eligible patients for transfer. -Urban hospitals were found to have prolonged door-in-door-out times compared with rural hospitals</p>	<p>-Patients selected were transferred from the emergency department to other acute care facilities</p>	<p>experienced hemorrhagic strokes</p>
<p>Sakowitz, S., Ng, A., Williamson, C. G., Verma, A., Hadaya, J., Khoraminejad, B., & Benharash, P. (2023). Impact of inter-hospital transfer on outcomes of urgent cholecystectomy. American journal of surgery, 225(1), 107–112. https://doi.org/10.1016/j.amjsurg.2022.09.035</p>	<p>Level III High Quality</p>	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of the study was to address the hypothesis that transferred patients who have nonelective cholecystectomy will experience increased complications, require greater</p>	<p>Interhospital transfers were found to be associated with greater occurrences of in-hospital mortality, resource utilization, as well as increased odds of infectious complications. -Nearly one-third of transfer patients developed an infection or postoperative sepsis. -Greater odds of transfer were found to occur within patients from lower income backgrounds and who had a greater occurrence of comorbidities. -Refining eligibility requirements for interhospital transfers may help optimize transfer timing, efficiency and care, and help to improve patient outcomes.</p>	<p>Retrospective Cohort Study (National Inpatient Sample)</p> <p>ICD-10 codes were used to identify patients undergoing cholecystectomy for acute cholecystitis</p>	<p>Specific information regarding transferring and admitting facilities, complications, length of stay or any clinical information on the procedure was not available, limiting knowledge of complete patient profile before selection</p>

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		resource use, and have higher odds of mortality			
Emanuelson, R. D., Brown, S. J., & Termuhlen, P. M. (2022). Interhospital transfer (IHT) in emergency general surgery patients (EGS): A scoping review. <i>Surgery open science</i> , 9, 69–79. https://doi.org/10.1016/j.sopen.2022.05.004	Level III High Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of this study was to determine what outcomes are related to interhospital transfer and what factors can be identified as opportunities for improvement	-Patients who were transferred had a median length of stay (LOS) ranging from 4-14.4 days, while non- transferred patients had a LOS that ranged from 2-5.8 days - Compared to patients who were not transferred, emergency general surgery transfer patients were found to have a 2.3%- 7.5% higher chance (increase) of in-hospital mortality.	Meta-Analysis Studies were included if they specific criteria: -patients were transferred with emergency general surgery -Study design was provided -Intervention or lack thereof regarding the transfer was included -All studies had to be conducted within the U. S.	-There were no clear parameters on the decision-making process to distinguish transfer patients to those who were not transferred -Physiologic status was unable to be accessed
Teng, C. Y., Davis, B. S., Kahn, J. M., Rosengart, M. R., & Brown, J. B. (2021). Factors associated with potentially avoidable interhospital transfers in emergency general surgery-A call for quality improvement efforts. <i>Surgery</i> , 170(5), 1298–1307. https://doi.org/10.1016/j.surg.2021.05.021	Level III High Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of this study was to determine the patterns of emergency general surgery patients	Of the 514,410 patient cases used for this study, 5.1% were involved in interhospital transfers. -27.4% of transfer patients were found to be potentially avoidable. - Factors relating to potentially avoidable transfers were self-pay status, the history of psychiatric or substance use disorder, and intestinal obstruction	Retrospective Cohort Study -States included: Arkansas, Florida, Maryland, Massachusetts, Nebraska, New York, Vermont, and Wisconsin. - these states allow long-term tracking of patients across hospitals	-Data on patient clinical information and severity of disease were not available -Reasons for patient transfer were not available

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		and determine what factors are associated with avoidable transfers			
Mueller, S. K., Shannon, E., Dalal, A., Schnipper, J. L., & Dykes, P. (2021). Patient and Physician Experience with Interhospital Transfer: A Qualitative Study. <i>Journal of patient safety</i> , 17(8), e752–e757. https://doi.org/10.1097/PTS.0000000000000501	Level III High Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to determine the experiences of transferred patients’ and physicians’ with interhospital transfers. -To determine the potential targets for improvement</p>	<p>-Three key factors in the decision to transfer:</p> <ol style="list-style-type: none"> 1) Patients need more specialized care 2) Familiarity with a physician 3) Expediting diagnostic/therapeutic testing. <p>-Patients and physicians expressed dissatisfaction with the unpredictable timing nature of transfers.</p> <p>-Physicians felt a disconnect in communication during the transfer process</p>	<p>Qualitative- Interview</p> <p>The interview consisted of:</p> <ul style="list-style-type: none"> -Adult patients who were recently transferred to oncology, general medicine, or cardiology within a tertiary care medical center -Transferring Physicians -Accepting attending physicians -Accepting/admitting resident physician 	<p>Study conducted only at one location</p> <ul style="list-style-type: none"> -Generability impacted
Taghlabi, K. M., Guerrero, J. R., Bhenderu, L. S., Xu, J., Nanda, R., Somawardana, I. A., Baradeiya, A. M. A., Tahanis, A., Cruz-Garza, J. G., Freyvert, Y., Trask, T. W., Huang, M., Barber, S. M., Holman, P. J., & Faraji, A. H. (2024). Influence of Hospital Transfer Status on Surgical Outcomes for Traumatic Thoracolumbar Spine Fractures: Insights from a Multicenter Investigation. <i>World neurosurgery</i> , 190, e637–e647. https://doi.org/10.1016/j.wneu.2024.07.197	Level III High Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to determine the perioperative outcomes between</p>	<p>-Transfer patients were found to have longer hospital length of stay when compared to direct admits (5.1-5.7 days vs 4.5-4.6 days respectively)</p> <p>-Transfer patients were found to have higher rates of surgical site infection, sepsis, and postoperative reintubation compared with direct admits.</p> <p>-Transfer patients were found to have higher 30-day mortality rates compared to direct admits</p>	<p>Retrospective Cohort Study</p> <p>American College of Surgeon National Surgical Quality Improvement Program (ACS-NSQIP) database used</p> <ul style="list-style-type: none"> -Patients who underwent spinal instrumentation and fusion surgeries due to thoracolumbar spine fractures were selected -2010-2021 	<p>Data regarding reason for transfer, information on referring facility, or if any delays in care were experienced were not able to be evaluated</p>

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		patients transferred from other facilities and those directly admitted -To determine if there are any predictors of complications and mortality			
Bergmark, R. W., Jin, G., Semco, R. S., Santolini, M., Olsen, M. A., & Dhand, A. (2023). Association of hospital centrality in inter-hospital patient-sharing networks with patient mortality and length of stay. PloS one, 18(3), e0281871. https://doi.org/10.1371/journal.pone.0281871	Level III High Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of this study was to determine if there are clinically significant associations between hospital network centrality and patient outcomes during interhospital transfers	-Peripheral hospitals had higher in-hospital mortality rates and longer length of stay than central hospitals for interhospital transfer patients - ‘High resource strain’ experienced by hospitals that most commonly take transfers (central hospitals)	Retrospective Cross-Sectional Study Study gathered data from Florida and California Outcomes were compared regarding hospital centrality using quartiles	-Possibility of confounding due to nature of observational study -Networks used within Florida and California do not represent all patient-sharing networks across all settings within healthcare
Walters, C., Cope, V., & Hopkins, M. P. R. (2023). Left behind: Exploring the concerns of emergency department staff when personnel are utilised for inter-hospital transfer. International emergency nursing, 69, 101298. https://doi.org/10.1016/j.ienj.2023.101298	Level III High Quality	HSO: Hospital System Research Domain: Quality Improvement	-Inadequate staffing, costs of interhospital transfer and high resource utilization were concerns for all medical professionals (RNs and physicians). -Informal observations due to time limits did not include formal vital sign sets required.	Qualitative Purposeful sampling method used Data collected and analyzed by semi-structured interviews	Small data sample that took place in one facility -Limits generalizability and diversity of responses and experiences

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
		<p>Problem Addressed: The purpose of this study was to explore the views and experiences of RNs and physicians when left behind because of escorted interhospital transfers -Discuss views on the decision-making process of interhospital transfers</p>	<p>-Researchers recommended that transfer service staff, incorporating decision-making protocols, could help create consistency during the interhospital transfer process.</p>		
<p>Dangayach, N. S., Morozov, M., Cossentino, I., Liang, J., Chada, D., Bageac, D., Salgado, L., Malekebu, W., Kellner, C., Bederson, J., & NEMAT Research Group (2024). A Narrative Review of Interhospital Transfers for Intracerebral Hemorrhage. <i>World neurosurgery</i>, 190, 1–9. https://doi.org/10.1016/j.wneu.2024.05.171</p>	<p>Level V Good Quality</p>	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to describe the epidemiology of interhospital transfers and intracerebral hemorrhage -To relationship between IHT and ICH and the impact on patient outcomes</p>	<p>-Closed-loop communication between referring and accepting clinicians and facilities may help streamline interhospital transfers with reduction in delays of care -Inadequate communication from referring hospital can interfere with abilities to fully assess incoming transfer patients -Transfer patients do not have a standardized protocol or structure to follow to help ensure efficiency of communication and care -Transfer patients for intracerebral hemorrhage had worsened outcomes -Researchers were able to establish a standardized transfer and data gathering template for triage of interhospital patients and found that those protocols reduced transfer times and minimized the</p>	<p>Literature Review -Researchers selected existing literature from 1993-2024 on interhospital transfers for intracerebral hemorrhage -Focus areas involved the association between interhospital transfers and fever prevention, glycemic control, coagulopathy reversal and blood pressure control based on 2022 AHA Guidelines.</p>	<p>-Number of sources used for study was not provided -Study did not mention potential for other factors to exist that could impact relationship between interhospital transfers and intracerebral patients</p>

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
		-Provide improvements to the IHT process to help improve patient outcomes for the long-term	loss of important clinical information.		
Franklin, B. J., Yenduri, R., Parekh, V. I., Fogerty, R. L., Scheulen, J. J., High, H., Handley, K., Crow, L., & Goralnick, E. (2023). Hospital Capacity Command Centers: A Benchmarking Survey on an Emerging Mechanism to Manage Patient Flow. <i>Joint Commission journal on quality and patient safety</i> , 49(4), 189–198. https://doi.org/10.1016/j.jcjq.2023.01.007	Level III Good Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of this study was to provide more insight into capacity command centers (CCCs) -Survey health system leaders to determine motivations, design, and performance measures for capacity command centers	-Capacity Command Centers can be a promising way for hospitals to manage patient flow during times when hospital capacity is exceeded. - A large motivation for capacity command centers was to reduce emergency department boarding. -More common functions for their implementation are associated with bed management (resource utilization) and interhospital transfers. ---With its incorporation, researchers found that Capacity Command Centers’ resource utilization in the form of bed turnaround time as well as capacity utilization measures improved.	Quantitative Online survey given to 38 hospital capacity management team - Questions related to design and performance of CCCs - Email response rate of 81.6% - -Top common functions in CCCs found were bed management, interhospital transfers, and financial return on investment	Sample size may not be large enough to be generalizable to large population -No breakdown of survey questions was provided -Potential for biased questions
Garabedian, P., Kain, J., Emani, S., Singleton, S., Rozenblum, R., Samal, L., & Mueller, S. (2025). User Requirements and Conceptual Design for an Electronic Data Platform for Interhospital Transfer Between Acute Care Hospitals: User-Centered Design Study. <i>JMIR human factors</i> , 12, e67884. https://doi.org/10.2196/67884	Level III High Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed:	-Clinicians felt interhospital transfers were associated with inadequate communication -Challenges were found when accessing patient information from transfer hospitals (patient summaries, medications, lab data, etc.) -Clinicians shared that with current health system electronic platforms,	Qualitative -Researchers utilized previous data on health information exchange along with user-centered design (UCD) process to engage with clinical users -Data on EHR workflow during interhospital	-Findings may not be generalizable due to all clinicians that participated in the study worked at the same health care facility using the program EPIC -Providers represented in the study do not represent a wide variety

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
		The purpose of this study was to examine viewpoints of interhospital transfers and patient information accessibility	finding relevant patient information was challenging, with the system being described as difficult and disorganized. -Researchers are in the process of generating user requirements and data accessibility for relevant patient information to be accessed within a 5-year timespan that estimated for the study.	transfers and planning was gathered -8 UCD sessions were held amongst 18 clinicians -Barriers along with suggested improvements for data access and timeliness of transfers were discussed.	of professional medical backgrounds
Almqvist, D., Norberg, D., Larsson, F., & Gustafsson, S. R. (2023). Strategies for a safe interhospital transfer with an intubated patient or where readiness for intubation is needed: A critical incidents study. <i>Intensive & critical care nursing</i> , 74, 103330. https://doi.org/10.1016/j.iccn.2022.103330	Level III Good Quality	HSO: Hospital System Research Domain: Quality Improvement Problem Addressed: The purpose of this study was to describe the experience of nurses (nurse anesthetists and intensive care nurses) who provide safety measures during interhospital transfers with intubated patients or patients in need of intubation	-There is no standardization within checklists to determine safety for interhospital transport of intubated patients. - Complexities of the patient may exceed the capabilities of nurses who are understaffed -A standardized protocol to enhance patient safety may be effective to identify potential limitations and extra resources for a transfer patient.	Qualitative 12 interviews (semi-structured phone interviews) conducted with nurses (nurse anesthetists and intensive care nurses). 197 critical incidents were identified during the interview when utilizing the critical incident technique -Researchers were able to determine five strategies to increase safety of interhospital transfers	-Potential for the critical incidents technique method to be restricted to perceive threat to patient safety higher than positive patient outcomes, which could potentially skew outcomes -Interactions between participants and researchers could be impacted due to phone call style methodology -Researchers conducting the interviews all had experience with interhospital transfers and intubation of patients which could potentially cause bias in their interpretation of the results and answers given by participants

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
Hoskins, T., Dawson, C., Booth, A., & Lewinsohn, A. (2024). An intra-arrest, secondary transfer of a patient for primary percutaneous coronary intervention case report. <i>Journal of Emergency and Critical Care Medicine</i> , 8. https://doi.org/10.21037/jeccm-24-33	Level IV Good Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this case study was to demonstrate that an intra-arrest secondary transfer can be lifesaving for some patients</p>	<p>-Patients experiencing cardiac arrest who undergo pre-hospital transfer have been associated with poor rates of survival, even with CPR.</p> <p>-There is limited study on secondary transfer of those patients who have a return of spontaneous circulation (ROSC)</p> <p>-Researchers suggest that to both benefit the patient and increase chances of survival, there should be a standardization process to identify those patients who have a reasonable probability of surviving.</p>	<p>Case Report</p> <p>57-year-old man experienced cardiac arrest, -Transfer conducted with CPR -ROSC achieved for 37 minutes</p>	<p>-Not generalizable -ROSC has limited research</p>
Renz-Kiefel, L., Lünse, S., Mantke, R., Eisert, P., Hilsmann, A., & Wisotzky, E. L. (2025). Inter-hospital transferability of AI: A case study on phase recognition in cholecystectomy. <i>Computers in biology and medicine</i> , 192(Pt B), 110235. https://doi.org/10.1016/j.combiomed.2025.110235	Level III High Quality	<p>HSO: Hospital System</p> <p>Research Domain: Quality Improvement</p> <p>Problem Addressed: The purpose of this study was to determine that transferability abilities of AI implemented phase recognition for patients experiencing cholecystectomies</p>	<p>-Due to a lack of training data and variability in surgical techniques, it can be difficult to evaluate the performance and efficiency of a surgical procedure.</p> <p>-Researchers found that AI technology can be transferred for surgical phase recognition.</p> <p>-AI may have the potential to help predict surgical outcomes and the various phases during a procedure. This may improve decision-based systems within clinical environments and may lead to more positive outcomes during surgical procedures of transfer patients.</p>	<p>Qualitative</p> <p>104 surgeries that were publicly available along with 21 surgeries filmed amongst the researchers for evaluation were utilized.</p> <p>Two-stage deep learning framework was conducted along with a multi-stage network for AI training used on MHB Data -AI models that utilized MHB data had an accuracy of 79.7% in terms of transferability while other networks scored lower.</p>	<p>The extensive data and resources that this program needs to excel would pose a large challenge for smaller clinics, limiting its applicability for other facilities</p>

Appendix D: DHA Thematic Analysis Results

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
<p>Fernandes-Taylor, S., Yang, D. Y., Schumacher, J., Ljumani, F., Fertel, B. S., & Ingraham, A. (2021). Factors associated with Interhospital transfers of emergency general surgery patients from emergency departments. <i>The American Journal of Emergency Medicine</i>, 40, 83–88. https://doi.org/10.1016/j.ajem.2020.12.012</p>	<p>No clear guidelines for patient selection or clinical information shared in hospital communications→ inconsistent decision making and adverse outcomes</p> <p>Interhospital transfer patients -> higher rates of comorbidities, delays in care, and higher costs</p>	<p>Improving Inter-Hospital Communication Sub-themes: Enhanced EHR data transfer -Communication expectations amongst referring and admitting physicians; communication amongst healthcare staff in preparation for incoming transfers</p> <p>Improving Time-Based Care Sub-themes: Prioritizing criteria for verbal vs. written communication - Adverse healthcare outcomes, feelings of disorganization amongst healthcare staff</p>
<p>Yu, A., Jordan, S.R., Gilmartin, H. et al. (2022). “Our hands are tied until your doctor gets here”: Nursing perspectives on inter-hospital Transfers. <i>Journal of General Internal Medicine</i>, 37, 1729–1736. https://doi.org/10.1007/s11606-021-07276-5</p>	<p>3 key themes relating to nursing experiences during interhospital transfer:</p> <ol style="list-style-type: none"> 1) Challenges with team communication and information exchange -Inconsistent access to shared electronic health records and incomplete or inaccurate handoff reports- difficulty in accessing patient needs 2) Preparation for anticipated transfers -No knowledge of patient background information, care plans, or ability to anticipate supplies and equipment needed 3) Determination of responsibilities and care plan initiatives after transfer -Longer gaps in receiving care due to evaluations and a perceived lack of immediacy. Ability to perform tasks based on role assignments and order placement 	<p>Improving Management of Care Expectations Sub-themes: Optimizing organization of transfer care plans - Expectations differences in patients and physicians - Dissatisfaction with care plans</p>
<p>Yu, A., McBeth, L., Westcott, C., Nicklas, J. M., Mueller, S., Dorsey Holliman, B., Ozkaynak, M., & Jones, C. D. (2024). Information exchange, responsibilities and expectation management in interhospital transfers: a qualitative study of hospital medicine physicians and advanced practice providers. <i>BMJ Open Quality</i>, 13(3), e002768. https://doi.org/10.1136/bmjopen-2024-002768</p>	<p>30 Hospitalists interviewed who expressed challenges relating to interhospital transfers. These challenges were able to be condensed into 3 key findings:</p> <ol style="list-style-type: none"> 1) Information Exchange -Untimely, incomplete, or inaccurate 2) Care Responsibilities 	<p>Improving Transfer Decision-Making Process Sub-themes: Enhancing patient eligibility criteria -Lack of clinical information shared amongst referring and admitting physicians -Doubts in reasonings to admit patients (patient eligibility)</p>

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	<p>-Uncertainty in decision-making process due to not personally evaluating patient and incomplete information received from transferring clinician</p> <p>3) Differing care expectations amongst patients and healthcare team members</p> <p>-Care plans not pre-established for expecting nursing staff due to accepting provider (by phone) often not being the admitting provider once patient arrives</p>	<p>Improving Management of Care Expectations Sub-themes: Optimizing organization of transfer care plans</p> <ul style="list-style-type: none"> - Challenges in expectations of patients vs physicians - Personal evaluations may be incomplete or absent
<p>Leven, E. A., Luo, Y., Nguyen, V. T., & Pourmand, K. (2022). Enhanced Communication for Interhospital Transfers Increases Preparedness in an Academic Tertiary Care Center. <i>Applied Clinical Informatics</i>, 13(4), 811–819. https://doi.org/10.1055/s-0042-1756371</p>	<p>Quality improvement effort to increase efficiency of shared clinical information for interhospital transfers (within inpatient hepatology service)</p> <p>Email notification system-> senior medicine residents Patient information updated daily by accepting providers</p> <p>Early notification and improved access to patient information helped healthcare teams feel more prepared, with a reduction in team assignments and delays in care</p>	<p>Improving Inter-Hospital Communication Sub-themes: Enhancing EHR data transfer</p> <ul style="list-style-type: none"> - Inadequate clinical information access (EHR, etc.) - Patients unaware of reasonings for transfer
<p>Jaan, A., Sarfraz, Z., Maryyum, A. et al. (2025). The impact of inter-hospital transfer on outcomes in lower gastrointestinal bleeding: a retrospective cohort analysis. <i>BMC Gastroenterol</i> 25, 183. https://doi.org/10.1186/s12876-025-03755-9</p>	<p>Patient Profiles: patients more likely to be transferred were often younger, more likely to be male, higher numbers of comorbidities, and often more likely to be admitted to larger, teaching hospitals within urban areas</p> <p>Interhospital transfer patients (LGIB) had higher odds of inpatient mortality, ICU admission, and higher odds of acute kidney injury and septic shock</p> <p>Higher rates of resource utilization- increased LOS by approximately 4.37 days.</p>	<p>Prioritizing Resource Utilization Sub-themes: Improving patient/bed management -Longer Length of Stay (LOS) associated with higher rates of illnesses and complications</p> <p>Increasing Positive Health Outcomes Sub-themes: Improving readmittance rates, improving 30-day outcomes</p> <ul style="list-style-type: none"> - Increase rates of complications, in-hospital mortality, increased rates of comorbidities, ICU admission, post-hospital complications, higher patient costs
<p>Chen, K. C., & Wen, S. H. (2023). Impact of interhospital transfer on emergency department timeliness of care and in-hospital outcomes of adult non-trauma patients. <i>Heliyon</i>, 9(2), e13393. https://doi.org/10.1016/j.heliyon.2023.e13393</p>	<p>Interhospital transfer patients:</p> <ol style="list-style-type: none"> 1) Shorter Emergency Department LOS 2) Longer Hospital LOS 3) Higher odds of in-hospital mortality 	<p>Prioritizing Resource Utilization Sub-themes: Improvement patient/bed management</p> <ul style="list-style-type: none"> - Higher usage of bed space >overcrowding and inadequate staff coverage

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
<p>Alagoz, E., Saucke, M., Arroyo, N., Fernandez Taylor, S., & Ingraham, A. (2022). Communication During Interhospital Transfers of Emergency General Surgery Patients: A Qualitative Study of Challenges and Opportunities. <i>Journal of patient safety</i>, 18(7), 711–716. https://doi.org/10.1097/PTS.0000000000000979</p>	<p>Transfer emergency general surgery (EGS) patients found to:</p> <ol style="list-style-type: none"> 1) Experience worse, adverse outcomes 2) Increased rates of in-hospital morbidity 3) Increased probability of mortality 4) Longer LOS <p>Deficiencies in provider communication presented challenges to course of action and establishing care plans.</p> <p>Different expectations in the amount and detail of patient information during transfer. Lack of standardization/structure presented difficulties for admitting provider to make transfer decisions from referring provider</p>	<p>Standardizing Transfer Process Sub-themes: Prioritizing transfer safety guidelines - Inefficiencies in assessing patient eligibility for transfer → inadequacies in provider communication (referring vs admitting)</p> <p>Improving Transfer Decision-Making Sub-themes: Enhancing patient eligibility criteria - Lack of clinical information shared amongst referring and admitting physicians and healthcare team - Doubts in patient eligibility</p>
<p>Downer, T., Halsall, R., Cole, R., Thomas, C., & Kearney, L. (2023). Nonurgent Pediatric Interhospital Transfers: A Narrative Enquiry of Nurses' Experiences in Australia. <i>Journal of emergency nursing</i>, 49(4), 564–573.e1. https://doi.org/10.1016/j.jen.2022.12.007</p>	<p>8 themes from nurse perspectives were found from the study:</p> <ol style="list-style-type: none"> 1) Proper transfer preparation for risk mitigation 2) Advocacy 3) Accountability for risk mitigation and patient decline during transfer 4) Maintaining standardized procedures 5) Training and mentorship practices to help build confidence 6) Maintaining relationships for interhospital and intrahospital transfers 7) Understanding the significance of transfer for families 8) Understanding and acknowledging transfer burdens and delays 	<p>Standardizing Transfer Protocols Sub-themes: Prioritizing transfer safety guidelines - Protocol for patient and family relay of information - Increase confidence within staff in patient eligibility and shared clinical profiles - Lack of inter-hospital network communication for patients</p>
<p>Baig, S. H., Gorth, D. J., & Yoo, E. J. (2022). Critical Care Utilization and Outcomes of Interhospital Medical Transfers at Lower Risk of Death. <i>Journal of intensive care medicine</i>, 37(5), 679–685. https://doi.org/10.1177/08850666211022613</p>	<p>Transfer patients found to have significantly longer ICU and hospital LOS</p> <p>Higher odds of mortality for interhospital transfer patients</p> <p>Interhospital transfer could be perceived as intervention method → however, without the quality metrics and</p>	<p>Prioritizing Resource Utilization Sub-themes: Improving patient/bed management - Longer Length of Stay (LOS) - Higher usage of bed space → overcrowding and inadequate staff coverage</p> <p>Increasing Positive Health Outcomes Sub-themes: Improving readmittance rates, improving 30-day outcomes</p>

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
	<p>clinical outcomes being aligned, transfers could result in worse, adverse outcomes for patients</p> <ul style="list-style-type: none"> -Transfer may create better quality metrics for referring hospital but may result in adverse outcomes for patients 	<p>-Quality metrics improve for referring hospital, adverse outcomes seen in admitting hospital</p>
<p>Lee, H., Lee, S., & Kim, H. (2023). Factors affecting the length of stay in the emergency department for critically ill patients transferred to regional emergency medical center. <i>Nursing open</i>, 10(5), 3220–3231. https://doi.org/10.1002/nop2.1573</p>	<p>Emergency Department LOS differed amongst interhospital transfer patients by hand-off communication.</p> <p>For patients who had proper communication (clinical information) shared to admitting facilities, there was a shorter ED LOS.</p>	<p>Prioritizing Resource Utilization Sub-themes: Improving patient/bed management, dynamic scheduling</p>
<p>Ludwig, A., Slota, J., Nunes, D. A., Vranas, K. C., Kruser, J. M., Scott, K. S., Huang, R., Johnson, J. K., Lagu, T. C., & Nadig, N. R. (2024). Interhospital Transfer of Patients With Acute Respiratory Failure in the United States: A Scoping Review. <i>Critical care explorations</i>, 6(7), e1120. https://doi.org/10.1097/CCE.0000000000001120</p>	<p>Gaps in decision-making regarding interhospital transfer patients exist-> possibly due to a lack of a standardized framework regarding patient eligibility for transfer</p> <p>Delays in transfer may cause potential benefits patients would experience to not be realized -> determining best timing of transfer has been a challenge for providers</p>	<p>Improving Time-Based Care Sub-themes: Prioritizing criteria for verbal vs. written communication</p> <ul style="list-style-type: none"> - Connected to gaps in decision-making process - Increased rates of potential adverse outcomes <p>Improving Transfer Decision-Making Sub-themes: Enhancing patient eligibility criteria</p> <ul style="list-style-type: none"> -Lack of information shared amongst referring and admitting physicians
<p>Allen, L., Vogt, K., Joos, E., van Heest, R., Saleh, F., Widder, S., Hameed, M., Parry, N. G., Minor, S., & Murphy, P. (2021). Impact of interhospital transfer on patient outcomes in emergency general surgery. <i>Surgery</i>, 169(2), 455–459. https://doi.org/10.1016/j.surg.2020.08.032</p>	<p>Researchers found that transferred patients were more likely to have at least one comorbidity and a greater ASA classification</p> <p>Higher rates of complications, mortality, and ICU admissions found within interhospital transfer patients</p> <p>Emergency General Surgery (EGS) patients transferred may be associated with worse patient outcomes and increased resource utilization than those directly admitted</p>	<p>Increasing Positive Health Outcomes Sub-themes: Improving readmittance rates, improving 30-day outcomes</p> <ul style="list-style-type: none"> -Inefficient interhospital transfers may be associated with outcomes such as-> increase rates of complications, in-hospital mortality, increased rates of comorbidities, ICU admission, post-hospital complications, higher patient costs
<p>Nadig, N. R., Brinton, D. L., Simpson, K. N., Goodwin, A. J., Simpson, A. N., & Ford, D. W. (2022). The Impact of Timing on Clinical and Economic Outcomes During Inter-ICU Transfer of Acute Respiratory Failure Patients: Time and Tide Wait for No One. <i>Critical care explorations</i>, 4(3), e0642. https://doi.org/10.1097/CCE.0000000000000642</p>	<p>Risk reductions of 20.5% regarding interhospital mortality were found within ARF patients who had early transfer – within 2 days</p> <p>Early transfers are associated with shorter hospital LOS, resource utilization, and lower costs</p>	<p>Prioritizing Resource Utilization Sub-themes: Improving patient/bed management, dynamic scheduling</p> <ul style="list-style-type: none"> -Longer Length of Stay (LOS) associated with interhospital transfers -Higher usage of bed space may lead to overcrowding and inadequate staff coverage

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	Differences in interhospital transfer frequency can be due to a variety of factors such as clinical presentation, demographic, or hospital level capabilities	
<p>Fernandes-Taylor, S., Yang, Q., Yang, D. Y., Hanlon, B. M., Schumacher, J. R., & Ingraham, A. M. (2023). Greater patient sharing between hospitals is associated with better outcomes for transferred emergency general surgery patients. <i>The journal of trauma and acute care surgery</i>, 94(4), 592–598. https://doi.org/10.1097/TA.0000000000003789</p>	<p>Results of interviews with nursing staff regarding interhospital transfer show 3 key findings:</p> <ol style="list-style-type: none"> 1) Having complete and appropriate clinical information about patients before transfer 2) Effective communication between referring hospitals/providers and accepting hospitals/providers 3) Decision-making consensus on whether the patient should be transferred <p>Results highlight that timely, accurate, and frequent communication between referring and admitting hospital can improve quality of care and patient outcomes -> also may lead to strengthening relationships between inter-organizational networks</p>	<p>Improving Inter-Hospital Communication Sub-themes: EHR data transfer, patient assessment, care plan timeliness</p> <p>Lack of effective communication may lead to adverse patient outcomes</p>
<p>Stamm, B., Royan, R., Giurcanu, M., Messe, S. R., Jauch, E. C., & Prabhakaran, S. (2023). Door-in-Door-out Times for Interhospital Transfer of Patients With Stroke. <i>JAMA</i>, 330(7), 636–649. https://doi.org/10.1001/jama.2023.12739</p>	<p>Approximately 72% of patients had door-in-door-out times over 120 minutes.</p> <p>Compared to other groups, patients with hemorrhagic stroke were found to have faster door-in-door-out times due to having a standard protocol for transfer. -These protocols involved established criteria for screening and identification of eligible patients for transfer.</p> <p>Urban hospitals were found to have prolonged door-in-door-out times compared with rural hospitals</p>	<p>Standardizing Transfer Process Sub-themes: Prioritizing transfer safety guidelines -Could decrease door-in-door out times -Improve screening measures for patients</p>
<p>Sakowitz, S., Ng, A., Williamson, C. G., Verma, A., Hadaya, J., Khoraminejad, B., & Benharash, P. (2023). Impact of inter-hospital transfer on outcomes of urgent cholecystectomy. <i>American journal of surgery</i>, 225(1), 107–112. https://doi.org/10.1016/j.amjsurg.2022.09.035</p>	<p>Interhospital transfers -> Associated with greater in-hospital mortality, risks of infectious complications, and higher resource utilization</p> <p>Approximately a third of transfer patients developed an infection or postoperative sepsis</p>	<p>Improving Positive Health Outcomes Sub-themes: Improving readmittance rates, improving 30-day outcomes -Increased rates of complications, in-hospital mortality, increased rates of comorbidities, ICU admission, post-hospital complications, higher patient costs</p>

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
	<ul style="list-style-type: none"> - Due to longer LOS, transfer patients are 5 times more likely to develop hospital-acquired infections 	
<p>Emanuelson, R. D., Brown, S. J., & Termuhlen, P. M. (2022). Interhospital transfer (IHT) in emergency general surgery patients (EGS): A scoping review. <i>Surgery open science</i>, 9, 69–79. https://doi.org/10.1016/j.sopen.2022.05.004</p>	<p>Transfer patients are associated with higher mortality rates and increased risks of complications -Higher resource utilization -Longer LOS and cost</p> <p>Lack of formal standardized approach to transfer, which highlights a challenge in decision-making and patient transfer eligibility</p> <p>Higher rates of EGS patients who underwent unnecessary transfers-> were discharged within 3 days with no intervention measures in place -Approximately 25% of interhospital transfers regarding EGS patients were potentially avoidable - Impacts bed space and may be associated with delays in patient care and increased resource utilization</p>	<p>Prioritizing Resource Utilization Sub-themes: Improving patient/bed management -Higher utilization due to associated higher risks of complications</p> <p>Standardizing Transfer Process Sub-themes: Prioritizing transfer safety guidelines -EGS-specific protocol can decrease delays in care and lower rates of unnecessary transfers</p>
<p>Teng, C. Y., Davis, B. S., Kahn, J. M., Rosengart, M. R., & Brown, J. B. (2021). Factors associated with potentially avoidable interhospital transfers in emergency general surgery-A call for quality improvement efforts. <i>Surgery</i>, 170(5), 1298–1307. https://doi.org/10.1016/j.surg.2021.05.021</p>	<p>Potentially avoidable transfers (PAT) occurred in 1 in 4 Emergency General Surgery (EGS) transfers -PAT are more common during weekends and at night -“Off-hour effect” -> associated with higher rates of hospital admissions, trauma and EGS operations</p> <p>Triage decision-making -> could benefit from risk stratification- based on severity assessment of conditions</p> <p>Improvement of transfer process- clear guidelines on transfer decisions and protocols, efficient communication, and support for patient care (telemedicine consultations, etc.)</p>	<p>Improving Transfer Decision-Making Sub-themes: Enhancing patient eligibility criteria -More clinical information provided could lead to a decrease in potentially avoidable transfers -Increase confidence in decision-making</p>
<p>Mueller, S. K., Shannon, E., Dalal, A., Schnipper, J. L., & Dykes, P. (2021). Patient and Physician Experience with Interhospital Transfer: A Qualitative Study. <i>Journal of patient safety</i>, 17(8), e752–e757. https://doi.org/10.1097/PTS.0000000000000501</p>	<p>Interview-based study→ patients, transferring physicians, accepting physicians, and accepting resident physicians.</p> <p>Themes present:</p>	<p>Improving Time-Based Care Sub-themes: Prioritizing criteria for verbal/written communication - Patient dissatisfaction with lack of knowledge on transfer process and procedures recommended</p>

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
	<ol style="list-style-type: none"> 1) Overall dislike of lack of timing and unpredictable nature of transfers 2) Patient: Dissatisfaction with delays in care and lack of notice before transfer -Disorganized chains of communication 3) Physicians: Delays in efficient clinical communication before and during exchange caused challenges and delays in care -Inconsistent and/or incomplete clinical information given by referring hospital to admitting hospital -Sense of disorder -Delays in treatment plans 	Standardizing Transfer Process Sub-themes: Prioritizing transfer safety guidelines -Improvement in clinical information shared → ensure eligibility
Taghlabi, K. M., Guerrero, J. R., Bhenderu, L. S., Xu, J., Nanda, R., Somawardana, I. A., Baradeiya, A. M. A., Tahanis, A., Cruz-Garza, J. G., Freyvert, Y., Trask, T. W., Huang, M., Barber, S. M., Holman, P. J., & Faraji, A. H. (2024). Influence of Hospital Transfer Status on Surgical Outcomes for Traumatic Thoracolumbar Spine Fractures: Insights from a Multicenter Investigation. <i>World neurosurgery</i> , 190, e637–e647. https://doi.org/10.1016/j.wneu.2024.07.197	Expedited transfers -> rapid diagnosis and needed treatments/interventions Delays in transfers -> increased risks of developing complications , longer hospital LOS , and adverse long-term health outcomes Transfer patients: Historically longer LOS , higher ICU admission rates, and higher resource utilization Compared with those admitted, transfer patients more likely to develop complication post operation -> higher odds of dying within 30 days of surgery	Improving Time-Based Care Sub-themes: Prioritizing criteria for verbal/written communication - Improvements shown with expedited transfers Increasing Positive Health Outcomes Sub-themes: Improving readmittance rates, improving 30-day outcomes -> increase rates of complications, in-hospital mortality, increased rates of comorbidities
Bergmark, R. W., Jin, G., Semco, R. S., Santolini, M., Olsen, M. A., & Dhand, A. (2023). Association of hospital centrality in inter-hospital patient-sharing networks with patient mortality and length of stay. <i>PloS one</i> , 18(3), e0281871. https://doi.org/10.1371/journal.pone.0281871	-Peripheral hospitals had higher in-hospital mortality rates and longer length of stay than central hospitals for interhospital transfer patients - ' High resource strain ' experienced by hospitals that most commonly take transfers (central hospitals)	Prioritizing Resource Utilization Sub-themes: Improving patient/bed management, dynamic scheduling -Higher usage of bed space may lead to overcrowding and inadequate staff coverage
Walters, C., Cope, V., & Hopkins, M. P. R. (2023). Left behind: Exploring the concerns of emergency department staff when personnel are utilised for inter-hospital transfer. <i>International emergency nursing</i> , 69, 101298. https://doi.org/10.1016/j.ienj.2023.101298	5 key themes found from perspectives of RNs and physicians during interhospital transfers <ol style="list-style-type: none"> 1) Burden of Transfer 2) Missed Care 3) Impact of being left behind during transfers 	Improving Transfer Decision-Making Sub-themes: Enhancing patient eligibility criteria -Nurse and physician doubt, timeliness of care plans and lack of information creates challenges and differences in expectations of care

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
	<ol style="list-style-type: none"> 4) Competing needs and its effect on the decision-making process 5) The effects that interhospital transfers can have on a staff comprised of different experience levels 	
<p>Dangayach, N. S., Morozov, M., Cossentino, I., Liang, J., Chada, D., Bageac, D., Salgado, L., Malekebu, W., Kellner, C., Bederson, J., & NEMAT Research Group (2024). A Narrative Review of Interhospital Transfers for Intracerebral Hemorrhage. <i>World neurosurgery</i>, 190, 1–9. https://doi.org/10.1016/j.wneu.2024.05.171</p>	<p>Closed-loop communication between referring and accepting clinicians and facilities may help streamline interhospital transfers with a reduction in delays of care</p> <p>Inadequate communication from referring hospital can interfere with abilities to fully assess incoming transfer patients</p> <p>Transfer patients do not have a standardized protocol or structure to follow to help ensure efficiency of communication and care</p> <p>Transfer patients for intracerebral hemorrhage had worsened outcomes</p>	<p>Improving Inter-Hospital Communication Sub-themes: Enhancing EHR data transfer</p> <ul style="list-style-type: none"> - Improvement needed in communication amongst referring and admitting facilities
<p>Franklin, B. J., Yenduri, R., Parekh, V. I., Fogerty, R. L., Scheulen, J. J., High, H., Handley, K., Crow, L., & Goralnick, E. (2023). Hospital Capacity Command Centers: A Benchmarking Survey on an Emerging Mechanism to Manage Patient Flow. <i>Joint Commission journal on quality and patient safety</i>, 49(4), 189–198. https://doi.org/10.1016/j.jcjq.2023.01.007</p>	<p>Capacity Command Centers may improve hospitals' ability to manage patient flow during times when hospital capacity is exceeded.</p> <p>Common functions for their implementation are associated with bed management (resource utilization) and interhospital transfers.</p>	<p>Prioritizing Resource Utilization Sub-themes: Improving patient/bed management, dynamic scheduling</p> <ul style="list-style-type: none"> - Lack of staff coverage, higher usage of bed space, overcrowding
<p>Garabedian, P., Kain, J., Emani, S., Singleton, S., Rozenblum, R., Samal, L., & Mueller, S. (2025). User Requirements and Conceptual Design for an Electronic Data Platform for Interhospital Transfer Between Acute Care Hospitals: User-Centered Design Study. <i>JMIR human factors</i>, 12, e67884. https://doi.org/10.2196/67884</p>	<p>Key themes from study relating to effective health information exchange during interhospital transfers:</p> <ol style="list-style-type: none"> 1) Complete patient data availability -Brief summaries on patients and medical history are often not provided before transfer -EHR system incompatibility leads to lack of radiology images/access -Incomplete clinical notes 2) Efficiency of data access -Different EHRs can make accessing patient information feel disorganized and difficult to navigate 3) Effective communication 	<p>Improving Management of Care Expectations Sub-themes: Optimizing organization of transfer care plans</p> <ul style="list-style-type: none"> - Brief summaries -> expedite care plan creation <p>Improving Inter-Hospital Communication Sub-themes: Enhancing EHR data transfer</p> <ul style="list-style-type: none"> - Disorganization in various EHR systems, compatibility concerns across networks

Author(s) and date	Findings with Initial Codes	Code List for Theme Development
	<p>-Lack of accurate contact information for transferring physician can lead to challenges in patient assessment -Clear communication needed -> written and verbal</p>	
<p>Almqvist, D., Norberg, D., Larsson, F., & Gustafsson, S. R. (2023). Strategies for a safe interhospital transfer with an intubated patient or where readiness for intubation is needed: A critical incidents study. <i>Intensive & critical care nursing</i>, 74, 103330. https://doi.org/10.1016/j.iccn.2022.103330</p>	<p>There is no standardization within checklists to determine safety for interhospital transport of intubated patients.</p> <p>Complexities of the patient may exceed the capabilities of nurses who are understaffed</p> <p>A standardized protocol to enhance patient safety may be effective to identify potential limitations and extra resources for a transfer patient.</p>	<p>Standardizing Transfer Protocols Sub-themes: Prioritizing transfer safety guidelines -Planning for resources and staff, staff capability differences depending on clinical needs of transfer patient</p>
<p>Hoskins, T., Dawson, C., Booth, A., & Lewinsohn, A. (2024). An intra-arrest, secondary transfer of a patient for primary percutaneous coronary intervention case report. <i>Journal of Emergency and Critical Care Medicine</i>, 8. https://doi.org/10.21037/jeccm-24-33</p>	<p>Patients experiencing cardiac arrest who undergo pre-hospital transfer have been associated with poor rates of survival, even with CPR.</p> <p>There is limited study on secondary transfer of those patients who have a return of spontaneous circulation (ROSC)</p> <p>Researchers suggest that to both benefit the patient and increase chances of survival, there should be a standardization process to identify those patients who have a reasonable probability of surviving.</p>	<p>Standardizing Transfer Protocols Sub-themes: Prioritizing transfer safety guidelines -Assessment criteria -> identification of patients with highest probability of survival, increase positive patient outcomes</p>
<p>Renz-Kiefel, L., Lünse, S., Mantke, R., Eisert, P., Hilsmann, A., & Wisotzky, E. L. (2025). Inter-hospital transferability of AI: A case study on phase recognition in cholecystectomy. <i>Computers in biology and medicine</i>, 192(Pt B), 110235. https://doi.org/10.1016/j.combiomed.2025.110235</p>	<p>Due to a lack of training data and variability in surgical techniques, evaluating the performance and efficiency of a surgical procedure may be challenging</p> <p>Researchers found that AI technology can be transferred for surgical phase recognition.</p> <p>-AI may have the potential to help predict surgical outcomes and the various phases during a procedure. This may improve decision-based systems within clinical environments and may lead to more positive health outcomes for patients</p>	<p>Improving Transfer Decision-Making Sub-themes: Enhancing patient eligibility criteria → improve evaluation measures, prediction of patient outcomes</p>

Appendix E: Final Concept/Thematic Map

